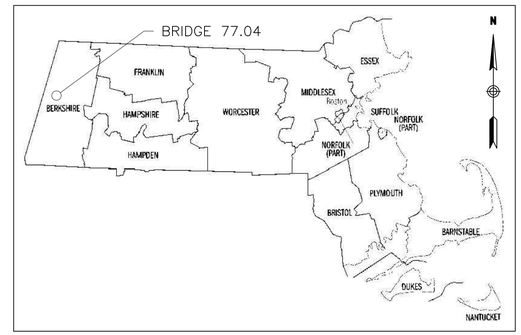
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
RAIL & TRANSIT DIVISION

REPLACEMENT OF BERKSHIRE LINE BRIDGE NO.77.04

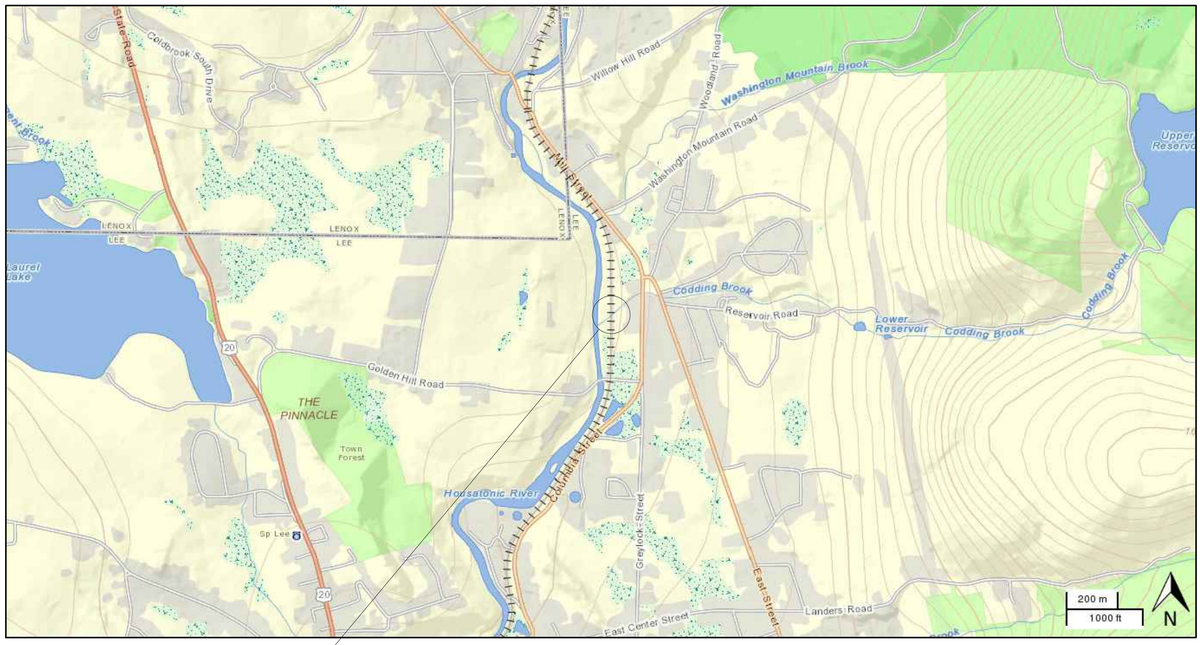
PROJECT LOCATION: LEE, MA



LOCATION MAP

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
G-1	TITLE SHEET & INDEX
TK-01	MAINLINE PLAN AND PROFILE STA. 0+00 TO STA. 4+00
TK-02	MAINLINE PLAN AND PROFILE STA. 4+00 TO STA. 6+60
XS-01	PROPOSED CROSS SECTIONS STA. 0+20 TO STA. 1+20
XS-02	PROPOSED CROSS SECTIONS STA. 1+40 TO STA. 2+40
XS-03	PROPOSED CROSS SECTIONS STA. 2+60 TO STA. 3+60
XS-04	PROPOSED CROSS SECTIONS STA. 3+80 TO STA. 4+80
XS-05	PROPOSED CROSS SECTIONS STA. 5+00 TO STA. 6+00
XS-06	PROPOSED CROSS SECTIONS STA. 6+20 TO STA. 6+50
S-1	STRUCTURAL GENERAL NOTES
S-2	KEY PLAN AND PROFILE
S-3	BORING SHEET 1 OF 3
S-4	BORING SHEET 2 OF 3
S-5	BORING SHEET 3 OF 3
S-6	DEMOLITION LIMITS PLAN AND ELEVATION
S-7	PROPOSED BRIDGE PLAN & ELEVATION
S-8	CONSTRUCTION STAGING
S-9	FOUNDATION LAYOUT DETAILS
S-9A	DETAILS FOR MICROPILE OPTION
S-10	ABUTMENT LAYOUT DETAILS
S-11	PIER LAYOUT DETAILS
S-12	ABUTMENT CAP REINFORCEMENT DETAILS
S-13	PIER CAP REINFORCEMENT DETAILS
S-14	WINGWALL LAYOUT AND REINFORCEMENT DETAILS
S-14A	MICROPILE OPTION FOR WINGWALLS
S-15	PRESTRESSED CONCRETE SLAB LAYOUT DETAILS
S-16	PRESTRESSED CONCRETE SLAB REINFORCEMENT DETAILS
S-17	WALKWAY LAYOUT & DETAILS
S-18	STEEL DETAILS
S-19	MISCELLANEOUS DETAILS



PLAN

BRIDGE 77.04

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
TITLE SHEET & INDEX

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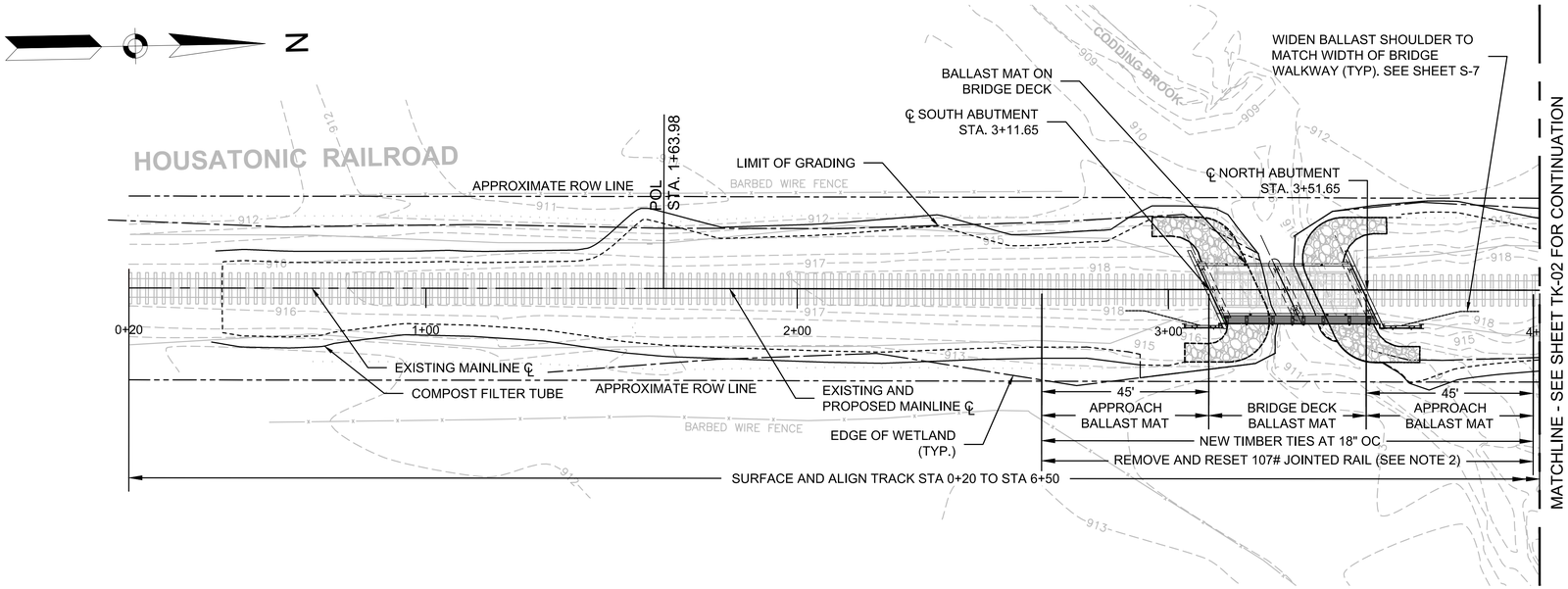
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massDOT Massachusetts Department of Transportation
Rail & Transit Division

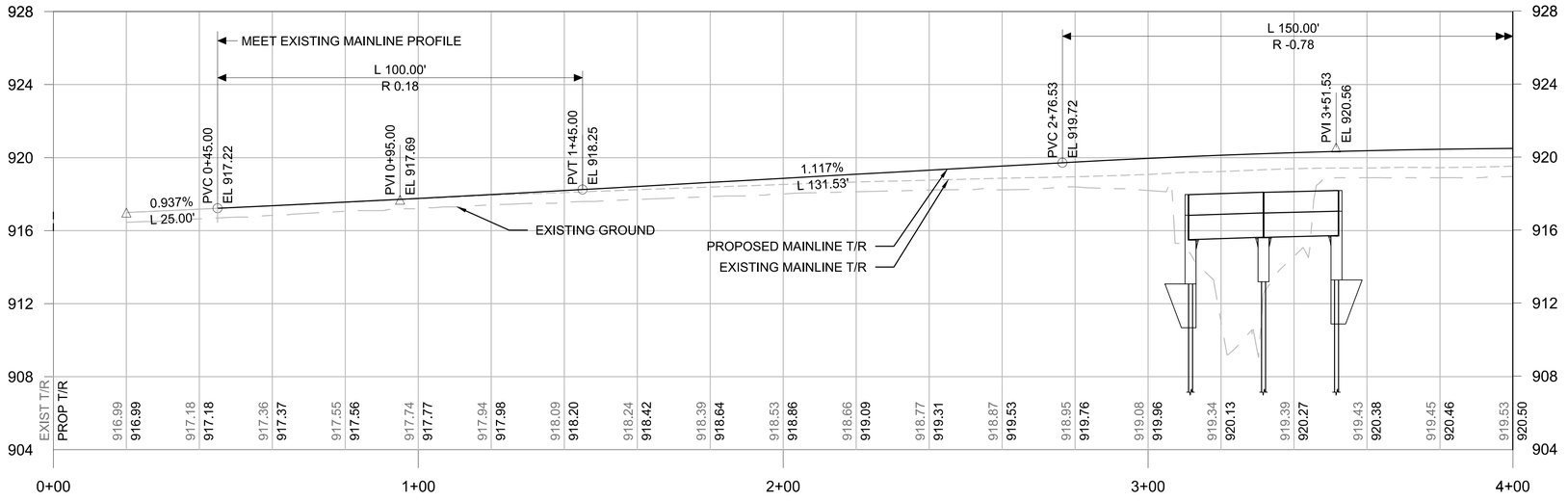
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DATE: 12/12/2022	A.T.	E.Y.	JQW	SHEET: G–1	

TO LEE

TO PITTSFIELD



PLAN



PROFILE

MAINLINE HORIZONTAL GEOMETRY DATA

ELEMENT	POINT	STATION	BEARING	COORDINATES	
				NORTHING	EASTING
TANGENT	POB	1+63.98	N 01°11'22" E	2947808.77	185234.09
	POE	5+00.28	N 01°11'22" E	2948144.99	185241.07

NOTES:

1. EXISTING TIES SHALL BE REMOVED WITHIN THE LIMITS SHOWN ON THE PLANS. TIES NOT IDENTIFIED FOR SALVAGE BY THE ENGINEER SHALL BE DISPOSED OF IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
2. EXISTING RAIL, PLATES, AND JOINT BARS TO BE REMOVED AND RESET. LIMIT OF RAIL REMOVAL SHALL BE AT THE FIRST RAIL JOINT LOCATED BEYOND THE TIE REPLACEMENT LIMIT.
3. BALLAST SHALL BE REMOVED TO A DEPTH OF 9" BELOW THE PROPOSED BOTTOM OF TIE ELEVATION IN TIE REPLACEMENT AREAS TO ALLOW FOR INSTALLATION OF APPROACH BALLAST MAT.
4. THE BRIDGE DECK BALLAST MAT SHALL EXTEND A MINIMUM OF THREE FEET BEYOND THE BRIDGE ABUTMENT.
5. EXISTING TRACK TO BE SURFACED AND ALIGNED TO MEET PROPOSED TRACK.

HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

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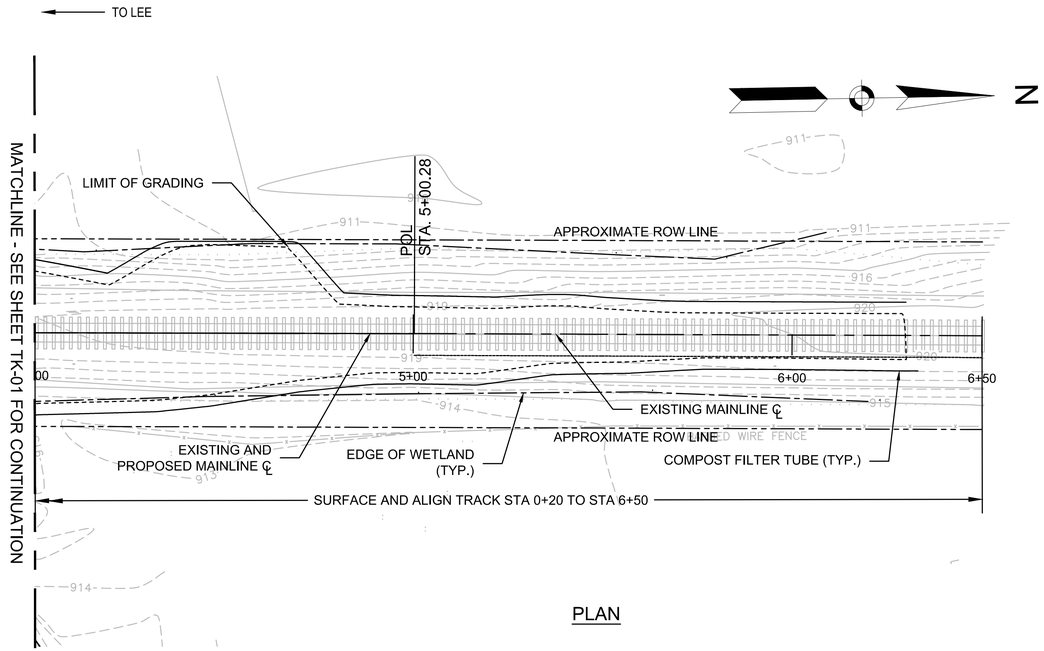
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
MAINLINE PLAN AND PROFILE
STA. 0+00 TO STA. 4+00

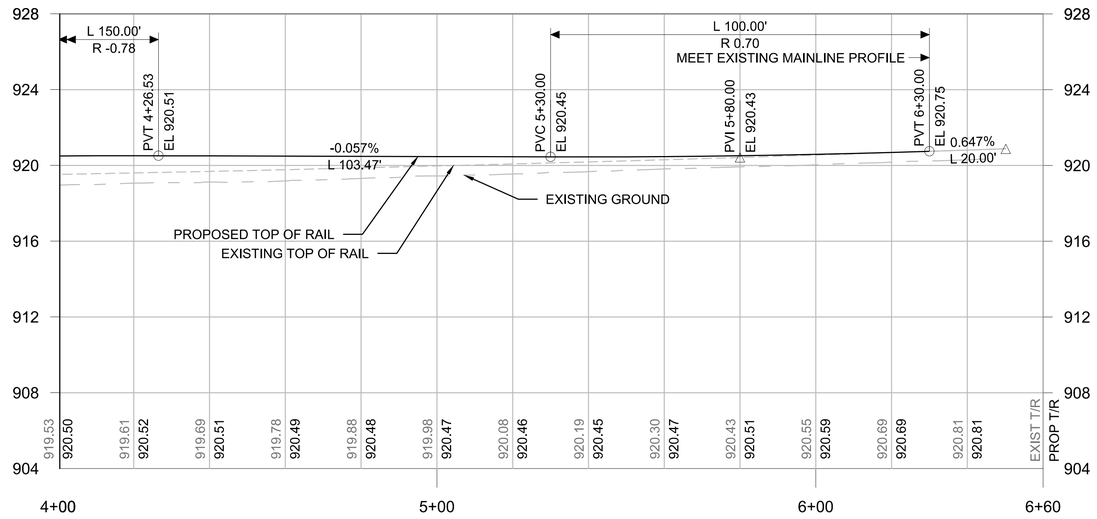
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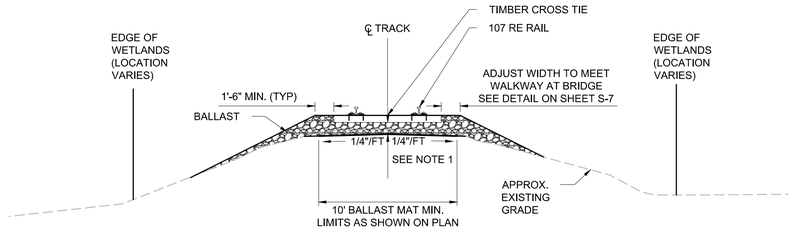
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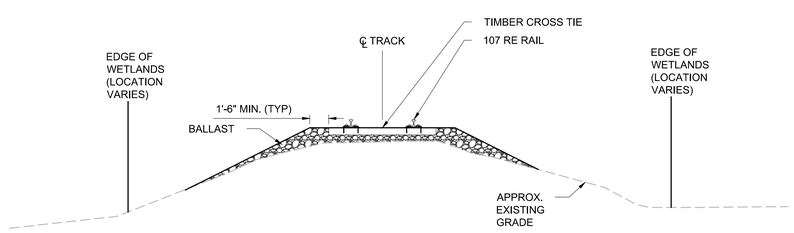
PLAN



PROFILE



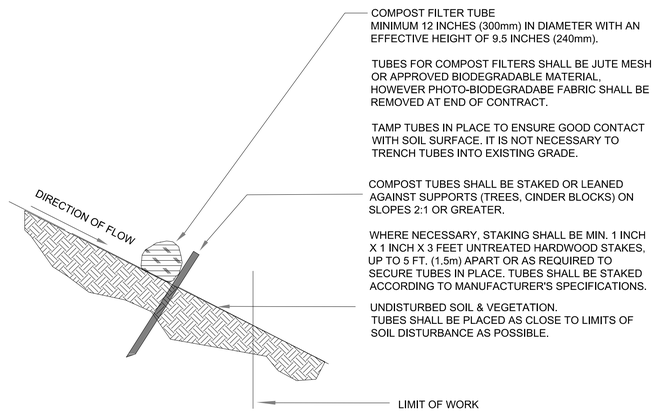
TYPICAL SECTION
STA.2+65 TO STA. 3+10 AND STA. 3+52 TO STA. 3+97
NOT TO SCALE

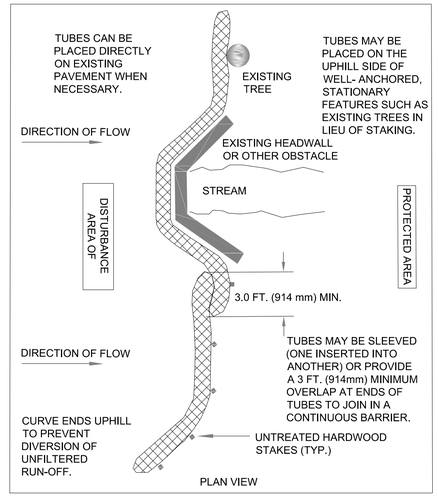


TYPICAL SECTION
STA. 0+45 TO STA. 2+65 AND STA. 3+97 TO STA. 6+30
NOT TO SCALE

NOTES:

1. BALLAST SHALL BE REMOVED TO A DEPTH OF 9" BELOW THE PROPOSED BOTTOM OF TIE ELEVATION IN THE TIE REPLACEMENT AREAS TO ALLOW FOR INSTALLATION OF APPROACH BALLAST MAT AND A MINIMUM OF 8" OF BALLAST.





GENERAL NOTES:

1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES (300mm) FOR SLOPES UP TO 50 FEET (15.24m) IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. TUBE LOCATION MAY BE SHIFTED TO ADJUST TO LANDSCAPE FEATURES, BUT SHALL PROTECT UNDISTURBED AREA AND VEGETATION TO MAXIMUM EXTENT POSSIBLE.
4. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
5. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
6. ADDITIONAL STAKING SHALL BE USED AT THE DIRECTION OF THE ENGINEER.

DETAIL 1 – COMPOST FILTER TUBE
NOT TO SCALE

HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

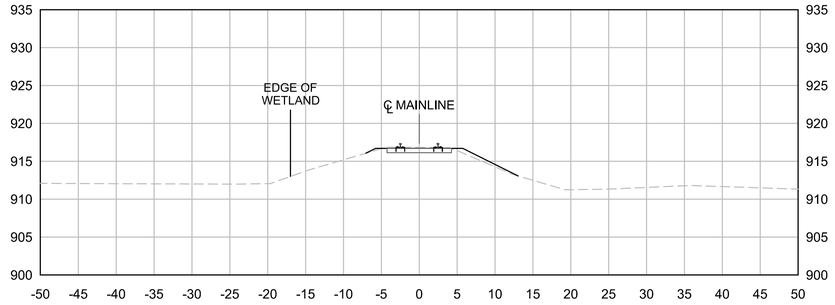
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
MAINLINE PLAN AND PROFILE
STA. 4+00 TO STA. 6+60

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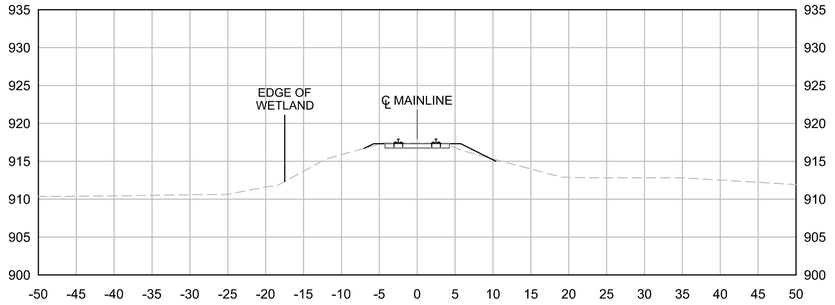
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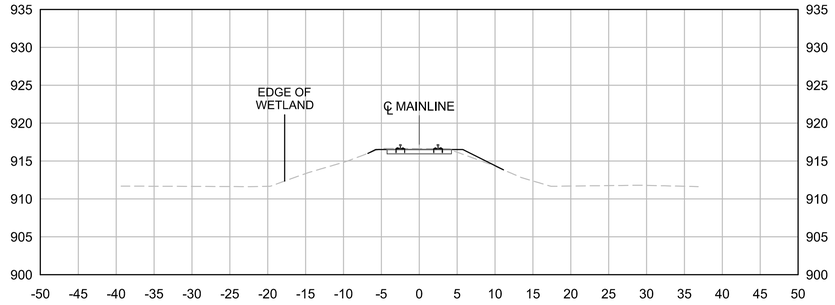
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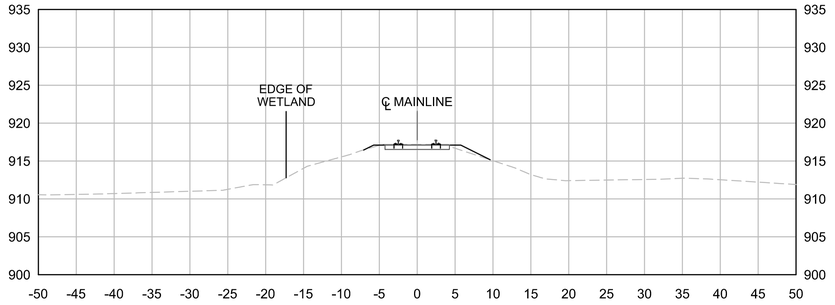
0+60



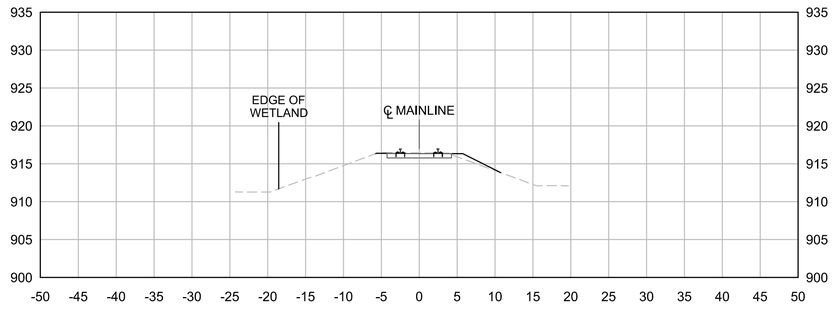
1+20



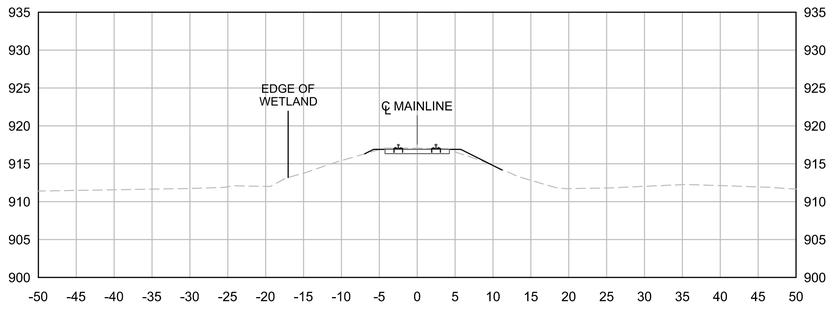
0+40



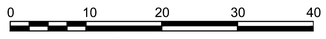
1+00



0+20



0+80



SCALE: 1" = 10'

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

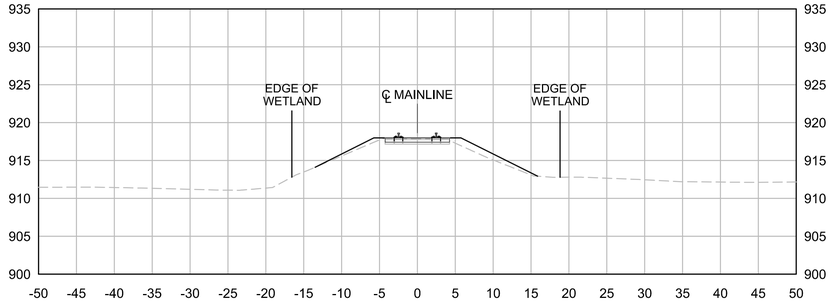
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PROPOSED CROSS SECTIONS
STA. 0+20 TO STA. 1+20

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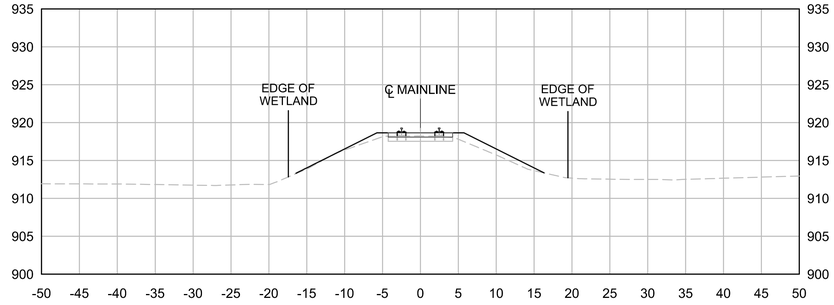
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Massachusetts Department of Transportation
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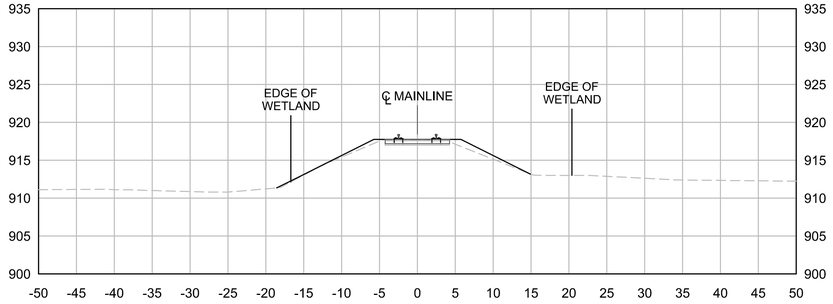
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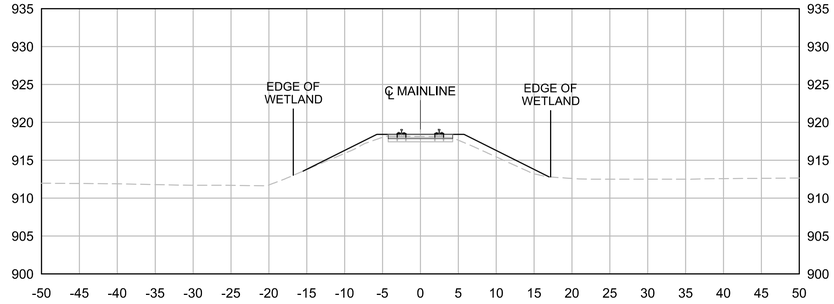
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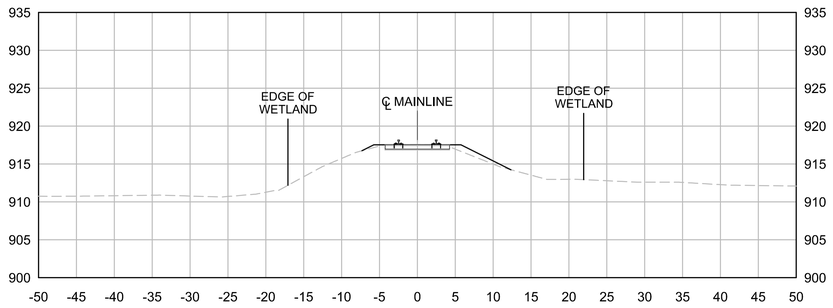
2+40



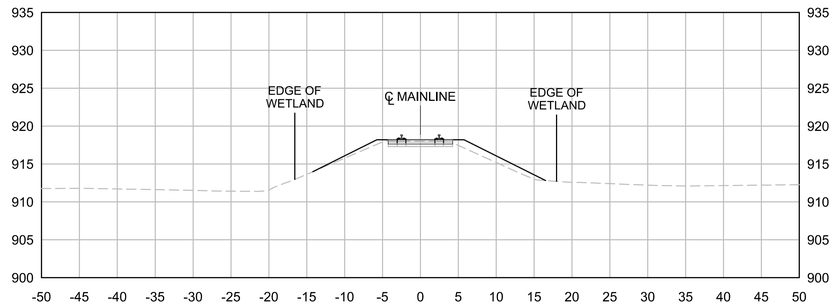
1+60



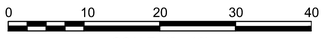
2+20



1+40



2+00



SCALE: 1" = 10'

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

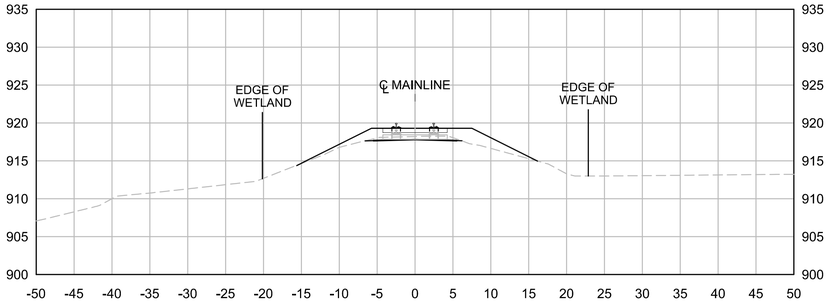
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PROPOSED CROSS SECTIONS
STA. 1+40 TO STA. 2+40

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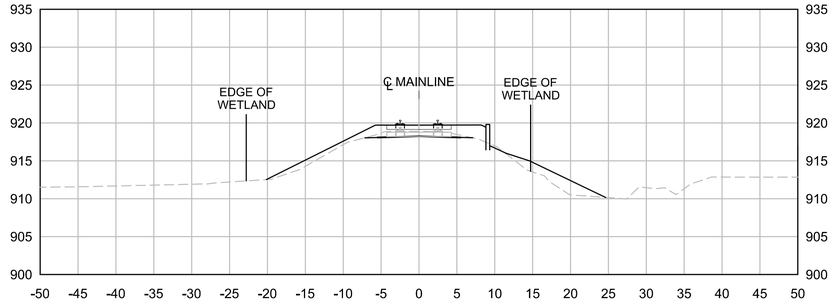
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Rail & Transit Division

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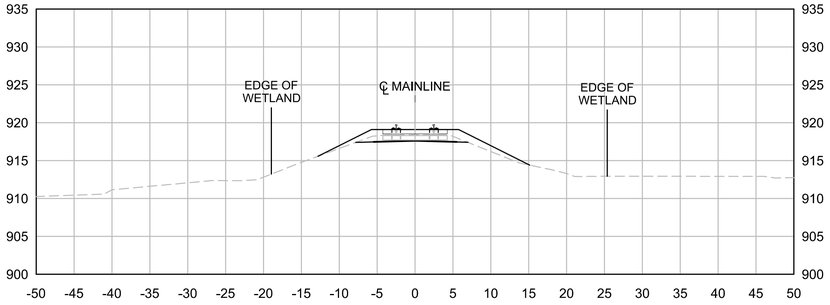
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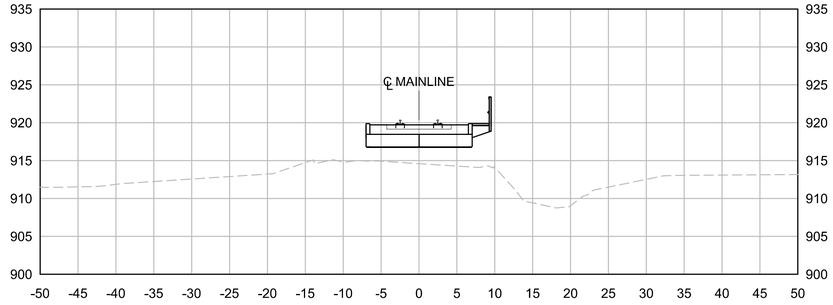
3+00



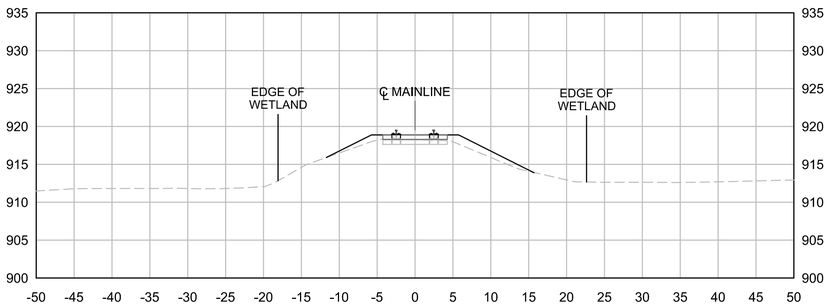
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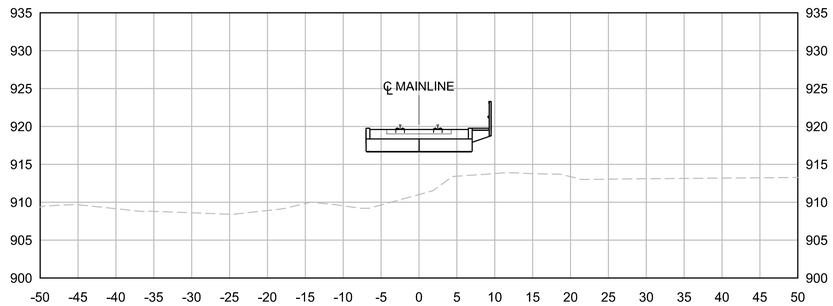
2+80



3+40

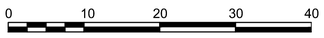


2+60



3+20

NOTE:
1) SEE STRUCTURAL PLANS FOR PROPOSED BRIDGE DETAILS.



SCALE: 1" = 10'

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

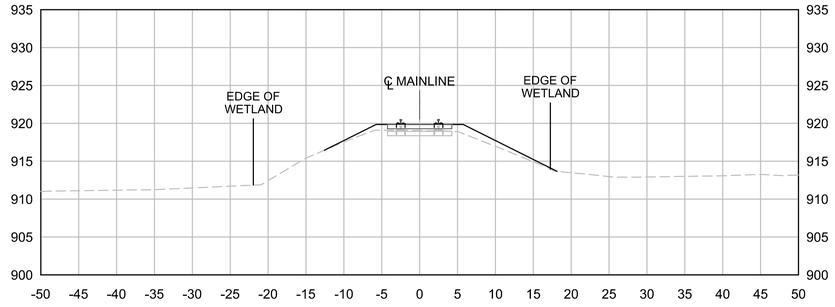
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PROPOSED CROSS SECTIONS
STA. 2+60 TO STA. 3+60

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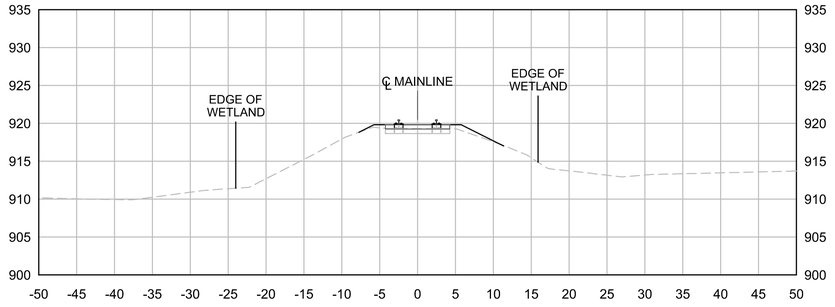
massDOT Massachusetts Department of Transportation
Rail & Transit Division

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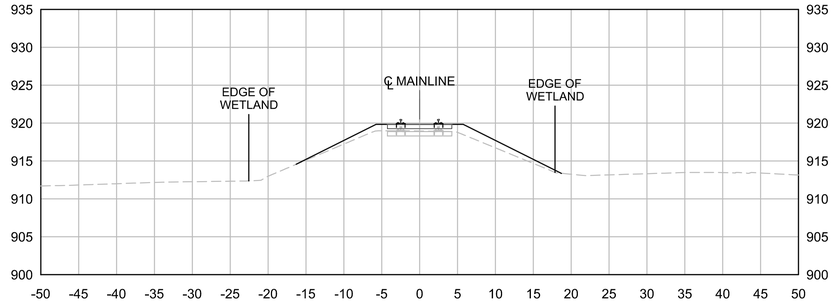
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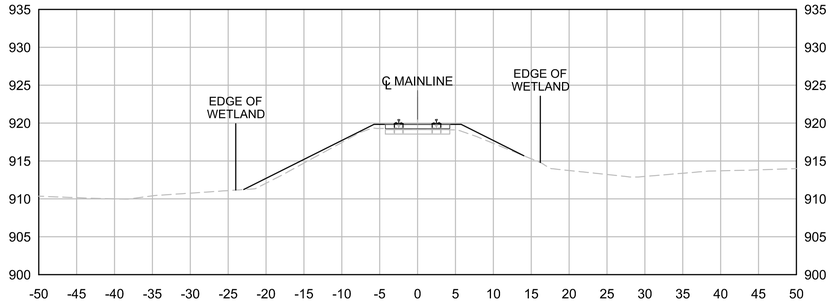
4+20



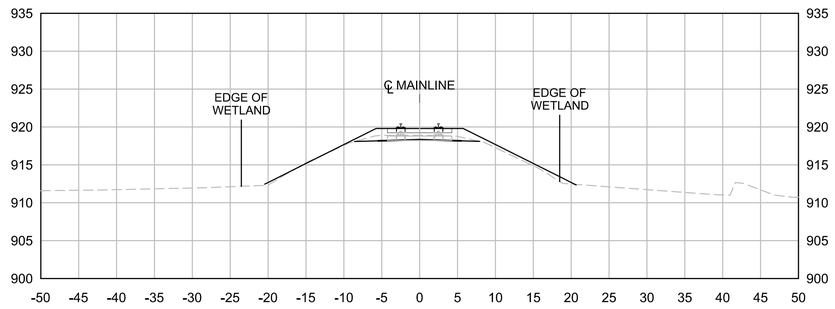
4+80



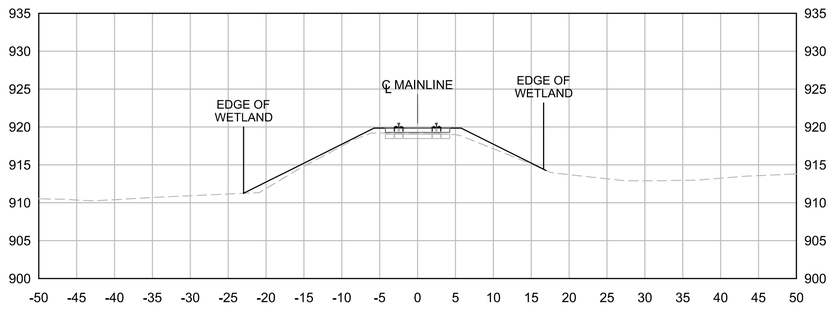
4+00



4+60



3+80



4+40

0 10 20 30 40

SCALE: 1" = 10'

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

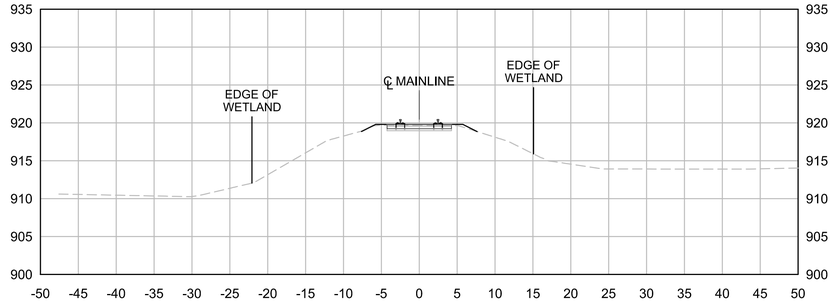
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PROPOSED CROSS SECTIONS
STA. 3+80 TO STA. 4+80

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

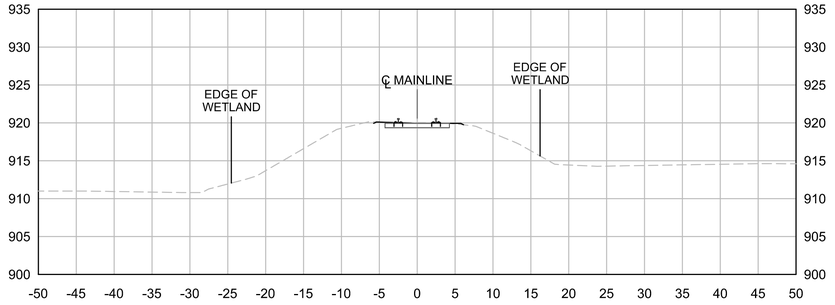
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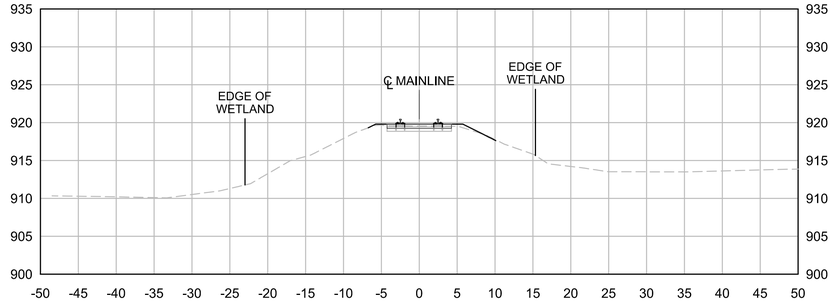
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DATE: 12/12/2022	CNL	CNL	NLK	SHEET: XS-04	



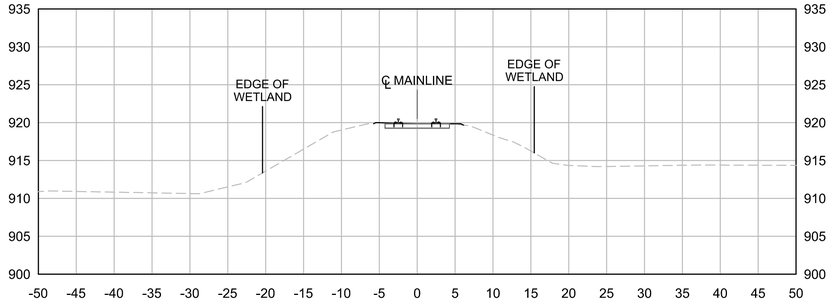
5+40



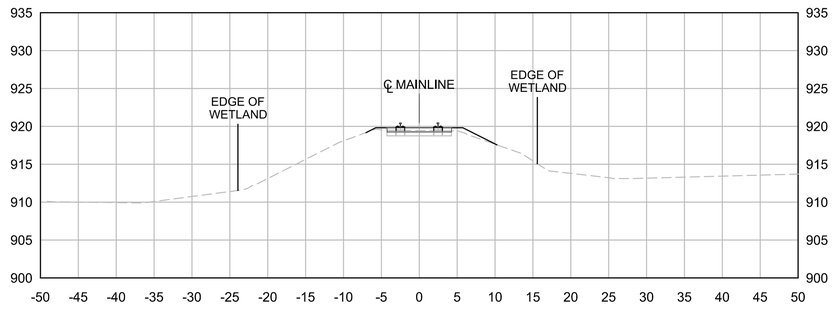
6+00



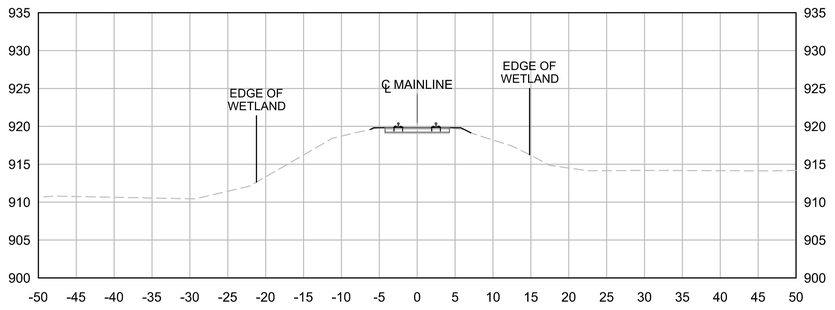
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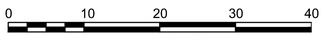
5+80



5+00



5+60



SCALE: 1" = 10'

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

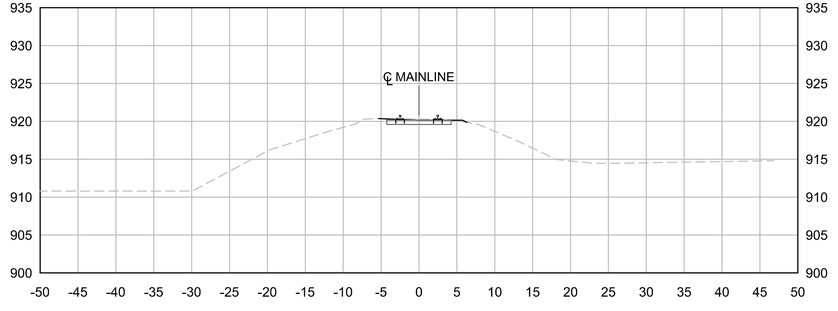
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PROPOSED CROSS SECTIONS
STA. 5+00 TO STA. 6+00

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

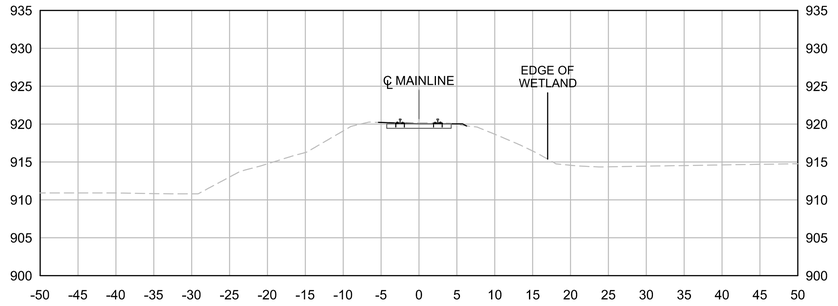
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6+40



6+20

0 10 20 30 40

SCALE: 1" = 10'

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PROPOSED CROSS SECTIONS
STA. 6+20 TO STA. 6+50

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STRUCTURAL GENERAL NOTES

DESIGN, CONTRUCTION AND FABRICATION

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2022 MASSDOT STANDARD SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS DATED JUNE 30, 2022, SPECIAL PROVISIONS PROVIDED IN THE CONTRACT DOCUMENTS, AND THE LATEST EDITION OF AMERICAN RAILWAY ENGINEERING AND MAINTENANCE-OF-WAY ASSOCIATION (AREMA) "MANUAL FOR RAILWAY ENGINEERING". IN THE EVENT OF DISCREPANCIES BETWEEN THE AREMA SPECIFICATIONS AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, THE MORE STRINGENT SPECIFICATION SHALL APPLY AS DETERMINED BY THE ENGINEER.

LIVE LOAD

THE DESIGN LIVE LOAD FOR THE BRIDGE IS AREMA COOPER E80 LOADING.

EXISTING CONDITIONS

ALL DIMENSIONS AND ELEVATIONS SHOWN ON EXISTING STRUCTURE ARE FROM LIMITED FIELD INVESTIGATION. ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR THE COMPLETION OF WORK SHALL BE DETERMINED BY THE CONTRACTOR BY FIELD MEASUREMENT AND PRE-CONSTRUCTION SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE FIELD MEASUREMENTS AND PRE-CONSTRUCTION SURVEY, AND SHALL NOT ORDER ANY MATERIAL OR BEGIN FABRICATION OR CONSTRUCTION UNTIL THE FIELD MEASUREMENTS AND PRE-CONSTRUCTION SURVEY ARE COMPLETED AND THE EXTENT OF THE PROPOSED WORK IS APPROVED BY THE ENGINEER.

DATUM

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

MATERIALS

CONCRETE

1. THE COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE:

   PRESTRESSED CONCRETE:
   f'_{ci} = 5,000 PSI (AT TRANSFER)
   f'_c = 7,000 PSI (28 -DAY)

   REMAINING:
   f'_c = 5,000 PSI (28 -DAY)

2. CONCRETE AGGREGATE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN THE CURRENT EDITION OF ASTM C33. COARSE AGGREGATE SHALL BE SIZE NO. 67.

PRESTRESSING STRANDS

1. PRESTRESSING STRAND SHALL BE 0.6-INCH DIAMETER, SEVEN-WIRE, UNCOATED, LOW-RELAXATION STRAND WHICH IS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN ASTM A416. THE STRAND SHALL HAVE AN ULTIMATE TENSILE STRENGTH OF 270 KSI. THE INITIAL PRESTRESS SHALL BE 43,400 LBS. PER STRAND UNLESS NOTED OTHER OTHERWISE.

2. STRAND SHALL BE TESTED IN ACCORDANCE WITH PCI RECOMMENDATIONS (MOUSTAFA METHOD) AND CERTIFIED BY THE FABRICATOR AS HAVING ADEQUATE BOND CHARACTERISTICS TO SATISFY THE PREDICTION EQUATIONS FOR TRANSFER AND DEVELOPMENT LENGTH GIVEN IN THE AREMA MANUAL FOR RAILWAY ENGINEERING.

3. AN ALTERNATE STRAND PATTERN WHICH HAS THE SAME ECCENTRICITY AS THE PATTERN SHOWN ON THIS PLAN AND IS BETTER SUITED TO THE MANUFACTURE'S FACILITIES WILL BE CONSIDERED. MANUFACTURER MUST SUBMIT PLAN AND COMPUTATIONS FOR RAILROAD APPROVAL PRIOR TO CASTING.

REINFORCING STEEL

1. REINFORCING STEEL SHALL BE DEFORMED AND EPOXY COATED, PER CURRENT ASTM A615 SPECIFICATIONS AND MUST MEET GRADE 60 REQUIREMENT. EPOXY COATING SHALL BE IN ACCORDANCE WITH ASTM A775.

2. FABRICATION OF REINFORCING STEEL SHALL BE PER CHAPTER 7 OF THE CRSI MANUAL OF STANDARD PRACTICE. DIMENSIONS OF BENDING DETAILS ARE OUT-TO-OUT OF BAR.

3. REINFORCING STEEL IS TO BE BLOCKED TO PROPER LOCATION AND SECURELY WIRED AGAINST DISPLACEMENT. USE PLASTIC PROTECTED REINFORCING SUPPORTS MEETING CRSI SPECIFICATIONS CHAPTER 3, CLASS 1. TACK WELDING OF REINFORCING IS PROHIBITED. MINIMUM CONCRETE ON REINFORCEMENT SHALL MEET CURRENT AREMA REQUIREMENTS.

   MINIMUM CONCRETE COVER
   DECK SLAB : 1 1/2 INCHES.
   REMAINDER : 2 INCHES, UNLESS OTHERWISE NOTED.

STEEL

1. STRUCTURAL STEEL PLATES AND BARS SHALL MEET THE REQUIREMENTS OF THE CURRENT ASTM DESIGNATION: A709, GR. 36. UNLESS OTHERWISE NOTED.

2. PILING SHALL BE STEEL H-PILES, ASTM A572, GRADE 50.

3. ALL WELDING AND THE PREPARATION AND ASSEMBLY OF MATERIAL FOR WELDING SHALL BE IN ACCORDANCE WITH THE BRIDGE WELDING CODE, ANSI/AASHTO/AWS D1.5. ELECTRODES SHALL BE E70XX.

GALVANIZING

1. ALL STEEL PIPES, ANGLES AND DECK PLATES SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123.

2. BOLTS, NUTS, INSERTS NUTS AND WASHERS SHALL BE GALVANIZED ACCORDING TO ASTM A153 (HOT DIP PROCESS) OR ACCORDING TO ASTM B695, CLASS 50. TYPE 1 (MECHANICAL PROCESS).

PAINTING

1. THE EXPOSED PORTION OF ANY STEEL (PILE PLATES, BRACKETS, LONGITUDINAL RESTRAINT BRACKETS, EMBEDDED PLATES, ETC.) SHALL BE PAINTED WITH ONE FIELD COAT OF CHEMICAL MASTIC CM-15 (OR APPROVED EQUAL), METALLIC ALUMINUM COLOR, APPLIED TO A DRY FILM THICKNESS OF 8 MILS. CORRESPONDING TO A WET FILM THICKNESS OF 10 MILS. PAINT APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTION.

2. INFORMATION PERTAINING TO CHEMICAL MASTIC CM-15 (OR APPROVED EQUAL) CAN BE OBTAINED FROM THE MANUFACTURER.

FABRICATION

CONCRETE

1. PRODUCTION PROCEDURES AND DIMENSIONAL TOLERANCES FOR THE MANUFACTURE OF PRECAST. PRESTRESSED GIRDERS SHALL BE IN ACCORDANCE WITH THE AREMA MANUAL FOR RAILWAY ENGINEERING AND THE PRESTRESSED CONCRETE INSTITUTES CURRENT MANUALL MNL -116 FOR QUALITY CONTROL.

2. TOLERANCE FOR LOCATION OF LIFTING LOOPS SHALL BE ± 1/2".

3. THE ENDS OF THE STRANDS SHALL BE CUT OFF FLUSH WITH THE END OF THE BEAM AND PAINTED. RECESSES AND MINOR SPALLS MUST BE FILLED AND FINISHED TO THE PLAN DIMENSIONS USING AN EPOXY BONDING COMPOUND AND GROUT.

4. CONCRETE CURB SHALL BE CAST AFTER THE GIRDER IS REMOVED FROM THE FORM.

5. CONCRETE BONDING AGENT: REFER TO SPECIFICATIONS.

6. SURFACES SHALL BE FORMED IN A MANNER WHICH WILL PRODUCE A SMOOTH AND UNIFORM APPEARANCE WITHOUT RUBBING OR PLASTERING. UNLESS OTHERWISE NOTED, EXPOSED EDGES OF 90-DEGREES OR LESS ARE TO BE CHAFFERED 3/4" X 3/4". UNFORMED SURFACES SHALL HAVE A SMOOTH FINISH FREE OF ALL FLOAT AND TROWEL MARKS.

7. THE FABRICATOR SHALL STENCIL THE FABRICATOR'S NAME, DATE OF FABRICATION PLACE MARK AND LIFTING WEIGHT ON EACH PIECE.

8. FABRICATOR IS RESPONSIBLE FOR ADEQUACY OF LIFTING DEVICES.

9. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.

10. ALL BAR-BENDING AND STANDARD HOOK DIMENSIONS SHALL BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE" AS PUBLISHED BY THE CONCRETE REINFORCING STEEL INSTITUTE UNLESS OTHERWISE SHOWN OR NOTED.

CONSTRUCTION

GENERAL

1. THERE IS NO CONSTRUCTION STAGING AREA AT THE JOB SITE DESIGNATED. AS REQUIRED, THE CONTRACTOR SHALL PROVIDE HIS/HER OWN OFF-SITE STAGING AREA.

2. THE CONTRACTORS'S ATTENTION IS CALLED TO THE FACT THAT CONTINUOUS COORDINATION WITH THE OPERATOR, HOUSATONIC RAILROAD COMPANY (HRRC), WILL BE REQUIRED THROUGHOUT CONSTRUCTION. HRRC WILL PROVIDE THE CONTRACTOR WITH FLAGGERS FOR PROTECTION FROM RAILROAD TRAFFIC WHILE WORK IS BEING PERFORMED ON THE RAILROAD RIGHT-OF-WAY (R.O.W.). THE CONTRACTOR SHALL NOT ENTER THE R.O.W. AT ANYTIME WITHOUT HRRC AUTHORIZATION. THE CONTRACTOR WILL ALSO BE REQUIRED TO OBTAIN R.O.W. TRAINING PRIOR TO WORKING IN THE R.O.W.

3. ALL WORK SHALL BE PERFORMED DURING A SERIES OF SHUTDOWNS OF RAILROAD TRAFFIC. THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWNS WITH HRRC. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION REGARDING SPECIFIC DATES, LENGTH OF SHUTDOWNS, AND LIQUIDATED DAMAGE PENALTIES FOR EXCEEDING AUTHORIZED TIME LIMITS.

4. ALL CONSTRUCTION AND ACCESS SHALL BE WITHIN THE R.O.W. UNLESS OTHERWISE APPROVED BY THE PROPERTY OWNER(S) AND MASSDOT. THE CONTRACTOR SHALL COORDINATE DIRECTLY WITH THE PROPERTY OWNER(S) TO OBTAIN WRITTEN APPROVAL OF LAND USE OUTSIDE THE R.O.W. THE CONTRACTOR SHALL SUBMIT COPIES OF WRITTEN PROPERTY AGREEMENTS TO THE RESIDENT ENGINEER.

5. ANY DAMAGE TO REMAINING EXISTING COMPONENTS THAT IS CAUSED BY THE CONTRACTOR'S ACTIVITY SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AS DIRECTED AND APPROVED BY THE ENGINEER, AT NO ADDITIONAL EXPENSE TO THE BRIDGE OWNER OR RAILROAD OPERATOR.

6. THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO ALL AREAS OF WORK ON THE BRIDGE FOR THE ENGINEER'S INSPECTIONS. COSTS SHALL BE INCLUDED IN MOBILIZATION.

7. ALL EXISTING MATERIALS NOT REUSED OR RESET AS PART OF THIS PROJECT SHALL BE CONSIDERED WASTE MATERIAL. ALL WASTE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF. ALL TREATED TIMBER SHALL BE DISPOSED OF ONLY AT AN APPROVED FACILITY.

8. COORDINATE RAIL TRAFFIC SHUTDOWNS AND THE USE OF TEMPORARY STAGING AREA DURING THE SHUTDOWN WITH THE RAILROAD.

MORTAR FOR SETTING BEAM

1. BEAMS SHALL HAVE FULL AND EVEN BEARING UPON THE BRIDGE SEAT AREAS. IF NEEDED, MORTAR CONSISTING OF EQUAL PARTS BY VOLUME OF CLASS B EPOXY AND DRY SILICA SAND, FIXED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, SHALL BE SPREAD ON THE TOP OF BEARING PADS TO OBTAIN UNIFORM BEARING. SCRAPE EXCESS MORTAR FROM AROUND BEARING PADS AFTER THE BEAMS ARE SET.

2. AFTER PRECAST CONCRETE MEMBERS ARE SET. THE ENDS OF THE LIFTING LOOP STRANDS SHALL BE BURNED OFF AND RECESSED TO A DEPTH OF 1 INCH. FILL RECESSES AT LIFT ANCHORS WITH CEMENT GROUT TO TOP OF SURROUNDING CONCRETE.

ENVIRONMENTAL:

1. THE CONTRACTOR SHALL PREVENT ANY CONSTRUCTION DEBRIS FROM ENTERING THE WATERWAYS, PUBLIC OR PRIVATE PROPERTY, OR TRAVELED WAYS DURING CONSTRUCTION. ALL WASTE MATERIAL GENERATED AS PART OF THIS PROJECT SHALL BE DISPOSED OF OFF SITE.

2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE STATUTES AND REGULATIONS RELATING TO THE PREVENTION AND ABATEMENT OF ALL POLLUTION.

3. SEE SPECIFICATIONS FOR REQUIREMENTS FOR WORKING AT PROJECT SITE.

ABBREVIATIONS:

B.F.	BACK FACE
BOT.	BOTTOM
E.F.	EACH FACE
EL. OR ELEV.	ELEVATION
EQ. SP.	EQUALLY SPACED
F.F.	FRONT FACE
R/F	REINFORCEMENT
TYP.	TYPICAL
W.P.	WORKING POINT

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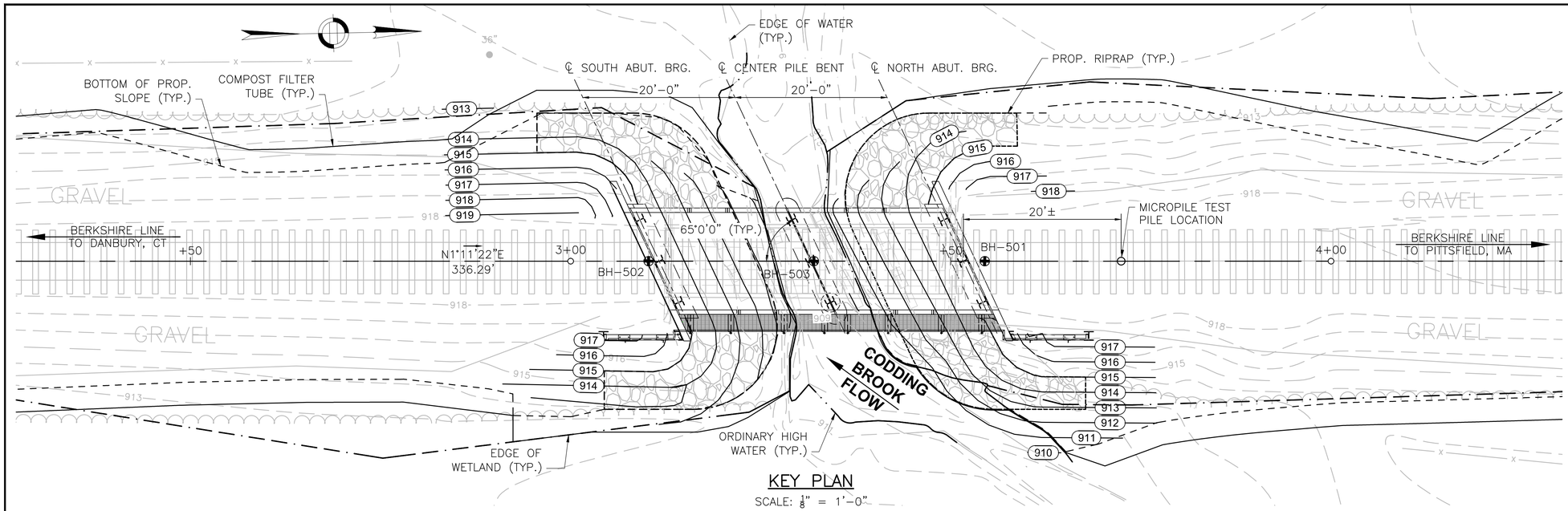
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
STRUCTURAL GENERAL NOTES

HDR, INC.
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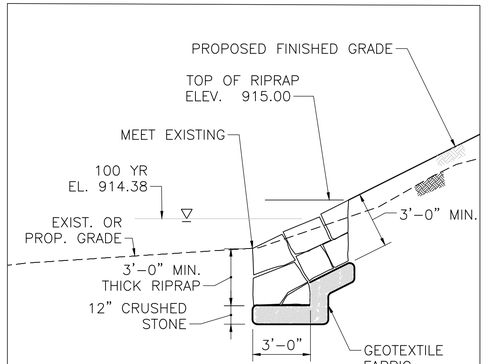
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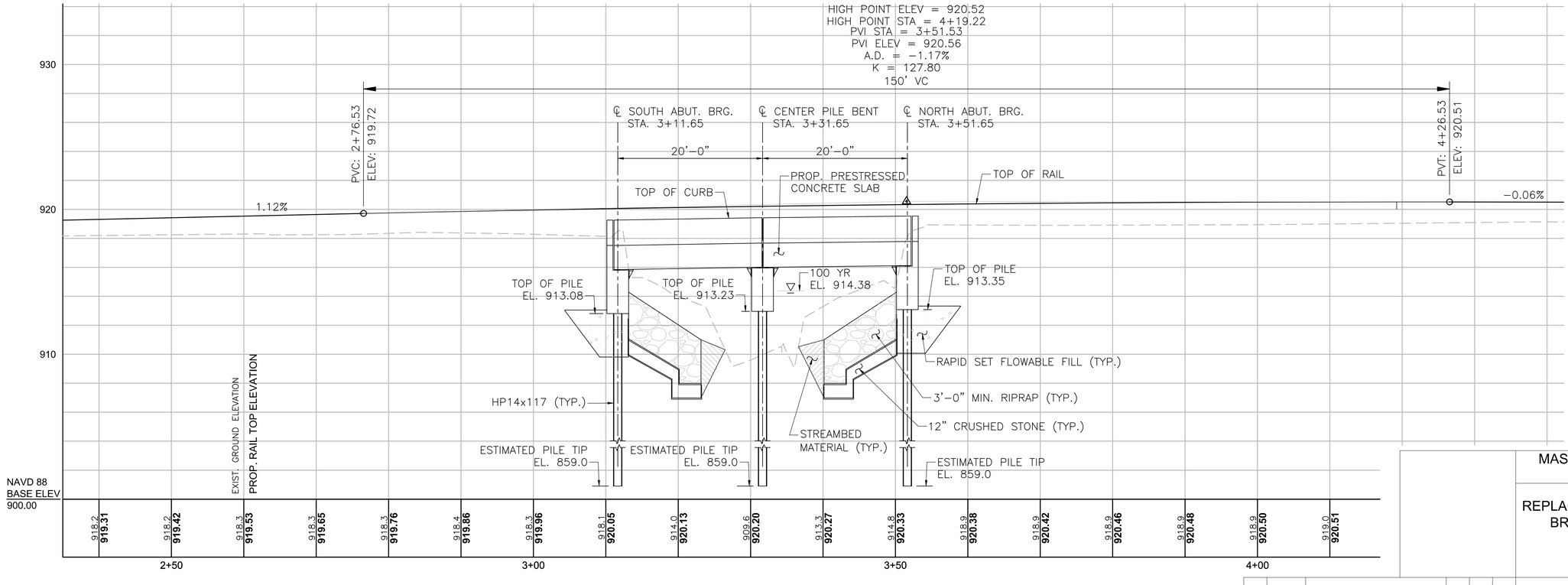
KEY PLAN

SCALE: $\frac{1}{8}$" = 1'-0"



RIPRAP DETAIL

SCALE: $\frac{1}{4}$" = 1'-0"



PROFILE

HORIZONTAL SCALE: $\frac{1}{8}$" = 1'-0"

VERTICAL SCALE: $\frac{1}{4}$" = 1'-0"

NOTES:

MICROPILE OPTION NOT SHOWN FOR CLARITY SEE SHEET S-9A FOR DETAILS.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
KEY PLAN AND PROFILE

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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BORING B501

BORING INFORMATION			
LOCATION: Bridge 77.16, North Abutment			BORING B501 PAGE 1 of 3
GROUND SURFACE EL. (ft): 919.4	DATE START/END: 10/10/2018 - 10/12/2018		
VERTICAL DATUM: NAVD 88	DRILLING COMPANY: Aquifer Drilling and Testing, Inc.		
TOTAL DEPTH (ft): 65.1	DRILLER NAME: Tim Van Ness / Dave		
LOGGED BY: D. Litton	RIG TYPE: CME Hi-Rail Mounted Truck Rig		

DRILLING INFORMATION		
HAMMER TYPE: Automatic	CASING I.D./O.D.: 4 inch / 4.5 inch	CORE BARREL TYPE: NX
AUGER I.D./O.D.: NA / NA	DRILL ROD O.D.: 2.675 inch	CORE BARREL I.D./O.D. 2 inch / 3 inch
DRILLING METHOD: Driven casing and washed with rotary tooling.		
WATER LEVEL DEPTHS (ft): ⧗ 8.8 10/12/2018 8:15 am		

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

TOP OF NORTH ABUTMENT PILE ELEV. 913.35

ELEV. 876.0

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks / Field Test Data	Layer Name	Soil and Rock Description
915	5	S1	0.5 to 2.5	24/1	3-6-7-7		SAND AND GRAVEL	S1: GRAVEL. Single piece of gravel in spoon.
		S2	2.5 to 4.5	24/0	6-7-8-8			S2: NO RECOVERY.
		S3	4.5 to 6.5	24/2	8-8-7-11			S3: NARROWLY GRADED GRAVEL WITH SAND (GP); ~80% coarse gravel, 15% sand, ~5% non-plastic fines; tan; moist. 1.5 inch gravel piece stuck in tip. <FILL>
		S4	6.5 to 8.5	24/11	8-6-6-9			S4: SILTY SAND WITH GRAVEL (SM); ~60% fine to coarse sand, ~25% fine to coarse gravel, ~15% non-plastic fines; tan to gray; moist. <FILL>
910	10	S5	8.5 to 10.5	24/14	11-16-14-12			S5: SILTY SAND (SM); ~70% fine to coarse sand, ~25% non-plastic fines, ~5% fine gravel; tan; wet. <FILL>
		S6	10.5 to 12.5	24/16	1-1-1-1		ORGANICS	S6: SILTY SAND (SM); ~60% fine to medium sand, ~40% non-plastic fines; tan to gray; wet. Organics.
		S7	12.5 to 14.5	24/7	5-7-19-17		SS	S7 (0-4"): SILTY SAND (SM); ~65% fine to medium sand, ~35% non-plastic fines; gray; wet.
905	15					Rig chatter ~15 ft.		S7 (4"-7"): WIDELY GRADED SAND WITH SILT (SW-SM) ~80% fine to coarse sand, ~10% non-plastic fines, ~10% fine gravel; tan; wet. 1 inch stone between layers.
		C1	16 to 21	60/15		Core times (min/ft): 14, 2, 1, 3, 4	GLACIAL TILL	C1: COBBLES AND GRAVEL. Hard. White and Gray. 1 to 5 inches thick.
900	20	S8	21 to 23	24/12	17-22-32-65			S8: SILTY GRAVEL WITH SAND (GM); ~50% fine to coarse gravel, ~35% fine to coarse sand, ~15% non-plastic fines; gray; wet.
895	25	S9	25 to 27	24/7	33-22-16-29			S9: SILTY GRAVEL WITH SAND (GM); ~50% fine to coarse gravel, ~30% fine to coarse sand, ~20% non-plastic fines; black; wet.
890	30	S10	30 to 32	24/18	17-17-21-25			S10: SILTY SAND WITH GRAVEL (SM); ~45% fine to coarse sand, ~40% fine to coarse gravel, ~15% non-plastic fines; tan; wet.
885	35	S11	35 to 37	24/15	13-18-17-24	Rig chatter ~33 ft.		S11: SILTY SAND (SM); ~80% fine to coarse sand, ~15% non-plastic fines, ~5% fine gravel; tan; wet.
880	40	S12	40 to 41.9	23/14	57-54-23-70/5"	Rig chatter ~38 ft.	GLACIAL TILL	S12: SILTY GRAVEL WITH SAND (GM); ~50% fine to coarse gravel, ~35% fine to coarse sand, ~15% non-plastic fines; tan to gray; wet.

BORING B501 (CONTINUED)

ELEV. 876.0

ESTIMATED PILE TIP ELEV. 859.0 FOR H-PILES

ESTIMATED PILE TIP ELEV. 847.0 FOR MICROPILE

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks / Field Test Data	Layer Name	Soil and Rock Description
875	45	S13	45 to 47	24/13	19-52-32-33		GLACIAL TILL	S13: SILTY GRAVEL WITH SAND (GM); Similar to S12.
870	50	S14	50 to 52	24/16	15-52-80-77			S14: SILTY SAND WITH GRAVEL (SM); ~50% fine to coarse sand, ~35% fine to coarse gravel, ~15% non-plastic fines; tan to gray; wet.
865	55	S15	55 to 55.3	4/3	100/4"		DECOMPOSED ROCK	S15: DECOMPOSED ROCK; White rock and drilling mud.
860	60	S16 C2	60 to 60.1 60.1 to 65.1	1/1 60/60	100/1" 30	Core times (min/ft): 5, 4, 5, 12, 7		S16: DECOMPOSED ROCK; 1 inch white decomposed rock.
855	65						DOLOMITIC MARBLE	C2: DOLOMITIC MARBLE; medium hard. White to Light Gray. Fractures at ~20 degrees from 0 to 12", ~60 degrees from 12 to 24 inches, horizontal fractures at ~2 to 3 inches o.c. from 24 to 48 inches, and fractures at ~60 degrees from 48 to 60 inches.
850	70							Bottom of boring at depth 65.1 ft. Borehole backfilled with tremie grout to existing grade.
845	75							
840	80							
835	85							

NOTES: Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineeers, LLC dated October 11, 2018.

PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 77.16
CITY/STATE: Lee, Massachusetts
GEI PROJECT NUMBER: 1703257

BORING NOTES:

1. LOCATION OF BRIDGE BORINGS SHOWN ON THE PLAN THUS: B# ⊕
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOG WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN BLOW COUNT COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 2" O.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. ALL BORINGS WERE MADE IN OCTOBER, 2018.
6. THE BORINGS WERE MADE BY AQUIFER DRILLING AND TESTING, INC., MINEOLA, NEW YORK.
7. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
BORING SHEET 1 OF 3

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

massDOT Massachusetts Department of Transportation Rail & Transit Division

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BORING B502

BORING INFORMATION

LOCATION: Bridge 77.16, South Abutment
GROUND SURFACE EL. (ft): 919.2
VERTICAL DATUM: NAVD 88
TOTAL DEPTH (ft): 70.0
LOGGED BY: D. Litton
DATE START/END: 10/12/2018 - 10/16/2018
DRILLING COMPANY: Aquifer Drilling and Testing, Inc.
DRILLER NAME: Dave
RIG TYPE: CME Hi-Rail Mounted Truck Rig

BORING B502
PAGE 1 of 3

DRILLING INFORMATION

HAMMER TYPE: Automatic
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Driven casing and washed with rotary tooling.
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: 4 inch / 4.5 inch
DRILL ROD O.D.: 2.675 inch
CORE BARREL TYPE: NX
CORE BARREL I.D./O.D. 2 inch / 3 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

TOP OF SOUTH ABUTMENT PILE ELEV. 913.08

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
							SAND AND GRAVEL	(0 - 4"): 4"RAIL. (4" - 12"): BALLAST.
915	5	S1	1 to 3	24/4	3-5-6-6			S1: SILTY GRAVEL WITH SAND (GM); ~50% fine to coarse gravel, ~35% fine to coarse sand, ~15% non-plastic fines; black; moist. <FILL>
		S2	3 to 5	24/14	3-3-4-4			S2: SILTY SAND (SM); ~60% fine to coarse sand, ~30% non-plastic fines, ~10% fine gravel; brown; moist. <FILL>
		S3	5 to 7	24/16	4-4-4-4			S3: SILTY SAND (SM); Similar to S2. Trace organics. <FILL>
		S4	7 to 9	24/16	4-4-4-3			S4: SILTY SAND (SM); Similar to S2. Wet. <FILL>
910	10	S5	9 to 11	24/11	20-29-23-9	Rollerbit grinding ~9.5 ft.	GLACIAL TILL	S5: SILTY GRAVEL WITH SAND (GM); ~55% fine to coarse gravel, 30% fine to coarse sand, ~15% non-plastic fines; brown to dark gray; wet.
		S6	11 to 13	24/12	7-15-11-6			S6: SILTY GRAVEL WITH SAND (GM); Similar to S5.
905	15	S7	13 to 15	24/10	5-3-12-18			S7: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~50% fine to coarse sand, ~40% fine to coarse gravel, ~10% non-plastic fines; brown; wet.
		S8	15 to 17	24/10	18-19-3-7			S8: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); Similar to S7.
		S9	17 to 19	24/8	8-8-14-22	Drive 4 inch casing to 20 ft.		S9: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); Similar to S7.
900	20	S10	20 to 22	24/11	20-15-20-16			S10: WIDELY GRADED GRAVEL WITH SILT AND SAND (GW-GM); ~50% fine to coarse gravel, ~40% fine to coarse sand, ~10% non-plastic fines; tan to gray; wet.
						Rig chatter.		
895	25	S11	24 to 26	24/9	10-9-10-7			S11: WIDELY GRADED GRAVEL WITH SILT AND SAND (GW-GM); ~55% fine to coarse gravel, ~35% fine to coarse sand, ~10% non-plastic fines; tan; wet.
						Rig chatter.		
890	30	S12	29 to 31	24/2	11-22-16-16			S12: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~55% fine to coarse sand, ~35% fine to coarse gravel, ~10% non-plastic fines; tan; wet.
						Rig chatter.		
885	35	S13	34 to 36	24/16	14-23-25-26			S13: SILTY SAND (SM); ~70% fine to coarse sand, ~25% non-plastic fines, ~5% fine gravel; tan; wet.
880	40	S14	39 to 41	24/14	10-14-19-22			S14: SILTY SAND (SM); ~60% fine to coarse sand, ~30% non-plastic fines, ~10% fine gravel; tan; wet.

ELEV. 876.0

BORING B502 (CONTINUED)

ELEV. 876.0

ESTIMATED PILE TIP ELEV. 859.0 FOR H-PILES

ESTIMATED PILE TIP ELEV. 847.0 FOR MICROPILE

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
875	45	S15	45 to 46.7	20/8	11-15-16-50/2"	Rig chatter.	GLACIAL TILL	S15: SILTY SAND WITH GRAVEL (SM); ~50% fine to coarse sand, ~30% non-plastic fines, ~20% fine to coarse gravel; gray; wet.
870	50	S16	50 to 52	24/18	30-50-46-42			S16: SILTY GRAVEL WITH SAND (GM); ~45% fine to coarse gravel, ~40% fine to coarse sand, ~15% non-plastic fines; gray; wet.
865	55	S17	55 to 55.2	2/2	50/2"		WEATHERED ROCK	S17: WEATHERED ROCK; ~90% weathered rock, ~10% fine to coarse sand; tan, gray, red; wet.
860	60	C1	60 to 65	60/60	23	Core times (min/ft): 5, 4, 4, 4, 4	DOLOMITIC MARBLE	C1: DOLOMITIC MARBLE; Moderate hard. Light Gray. Highly fractured. Fractured horizontal to vertical.
855	65	C2	65 to 70	60/60	43	Core times (min/ft): 4, 3, 3, 4, 4		C2 (0 - 22"): DOLOMITIC MARBLE; Similar to C1. C2 (22" - 60") : DOLOMITIC MARBLE; Moderate hard. Gray. Highly fractured. Fractured at 0 - 45 degree planes.
850	70							Bottom of boring at depth 70 ft. Borehole backfilled with tremie grout to existing grade.
845	75							
840	80							
835	85							

NOTES: Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineeers, LLC dated October 11, 2018.

PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 77.16
CITY/STATE: Lee, Massachusetts
GEI PROJECT NUMBER: 1703257

NOTE:

FOR BORING NOTES, SEE SHEET S-3.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
BORING SHEET 2 OF 3

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

massDOT Massachusetts Department of Transportation Rail & Transit Division

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BORING B503

TOP OF PIER PILE
ELEV. 913.23

BORING INFORMATION
LOCATION: Bridge 77.16, Mid-span
GROUND SURFACE EL. (ft): 919.3
VERTICAL DATUM: NAVD 88
TOTAL DEPTH (ft): 37.0
LOGGED BY: D. Litton
DATE START/END: 10/16/2018 - 10/17/2018
DRILLING COMPANY: Aquifer Drilling and Testing, Inc.
DRILLER NAME: Tim Van Ness
RIG TYPE: CME Hi-Rail Mounted Truck Rig

BORING B503
PAGE 1 of 2

DRILLING INFORMATION
HAMMER TYPE: Automatic
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Spun and driven casing and washed with rotary tooling.
WATER LEVEL DEPTHS (ft): ▼ 8.1 10/17/2018 10:24 am
CASING I.D./O.D.: 4 inch / 4.5 inch
DRILL ROD O.D.: 2.675 inch
CORE BARREL TYPE: NA
CORE BARREL I.D./O.D. NA / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
915	5							10'-5" to Stream Bed
		S1	10.4 to 12.4	24/4	15-13-15-20	Rig chatter.	SAND AND GRAVEL	S1: WIDELY GRADED GRAVEL WITH SAND (GW); ~80% fine to coarse gravel, ~15% fine to coarse sand, ~5% non-plastic fines; brown; wet. Timbers in Tip.
910	10	S2	12.4 to 14.4	24/8	10-9-38-68			S2: WIDELY GRADED GRAVEL WITH SAND (GW); ~65% fine to coarse gravel up to 2 inches, ~30% fine to coarse sand, ~5% non-plastic fines; dark brown; wet.
905	15	S3	14.4 to 15.2	9/9	74-100/3"			S3: WIDELY GRADED GRAVEL WITH SILT AND SAND (GW-GM); ~50% fine to coarse gravel, ~40% fine to coarse sand, ~10% non-plastic fines; dark brown; wet. ~4 inches timber in spoon.
		S4	16 to 18	24/18	38-38-36-38			S4: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); ~55% fine to coarse sand, 35% fine to coarse gravel, ~10% non-plastic fines; brown; wet. ~6 inches of timber in top of spoon.
		S5	18 to 20	24/10	19-52-51-40			S5: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM); Similar to S4. No wood.
900	20	S6	20 to 22	24/11	19-30-21-14	Rollerbit through timber. Open hole after ~20 ft.	SILTY SAND	S6: SILTY SAND WITH GRAVEL (SM); ~65% fine to coarse sand, ~20% non-plastic fines, ~15% fine gravel; gray; wet.
		S7	22 to 24	24/19	12-16-18-21			S7: SILTY SAND WITH GRAVEL (SM); Similar to S6. Tan.

NOTES: S1 - S4 taken with 3" O.D. Split Spoon sampler. Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineeers, LLC dated October 11, 2018.

PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 77.16
CITY/STATE: Lee, Massachusetts
GEI PROJECT NUMBER: 1703257

BORING B503 (CONTINUED)

LOCATION: Bridge 77.16, Mid-span
GROUND SURFACE EL. (ft): 919.3
VERTICAL DATUM: NAVD 88
DATE START/END: 10/16/2018 - 10/17/2018
DRILLING COMPANY: Aquifer Drilling and Testing, Inc.

BORING B503
PAGE 2 of 2

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
895	25	S8	25 to 27	24/10	16-41-35-43		GLACIAL TILL	S8: WIDELY GRADED SAND WITH GRAVEL (SW); ~70% fine to coarse sand, ~25% fine to coarse gravel, ~5% non-plastic fines; tan to gray at 6 inches into spoon. Wet.
890	30	S9	30 to 32	24/11	15-14-14-19	Lost mud at ~30 ft. Remix and continue. Roller bit grinding.		S9: SILTY SAND WITH GRAVEL (SM); ~65% fine to coarse sand, ~25% fine gravel, ~20% non-plastic fines; tan; wet.
885	35	S10	35 to 37	24/3	30-37-44-45			S10: WIDELY GRADED GRAVEL WITH SAND (GW); ~80% fine to coarse gravel, ~15% fine to coarse sand, ~5% non-plastic fines; tan; wet.
880	40							Bottom of boring at depth 37 ft. Borehole backfilled with tremie grout to existing grade.
875	45							
870	50							
865	55							

NOTES: S1 - S4 taken with 3" O.D. Split Spoon sampler. Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineeers, LLC dated October 11, 2018.

PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 77.16
CITY/STATE: Lee, Massachusetts
GEI PROJECT NUMBER: 1703257

NOTE:

FOR BORING NOTES, SEE SHEET S-3.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

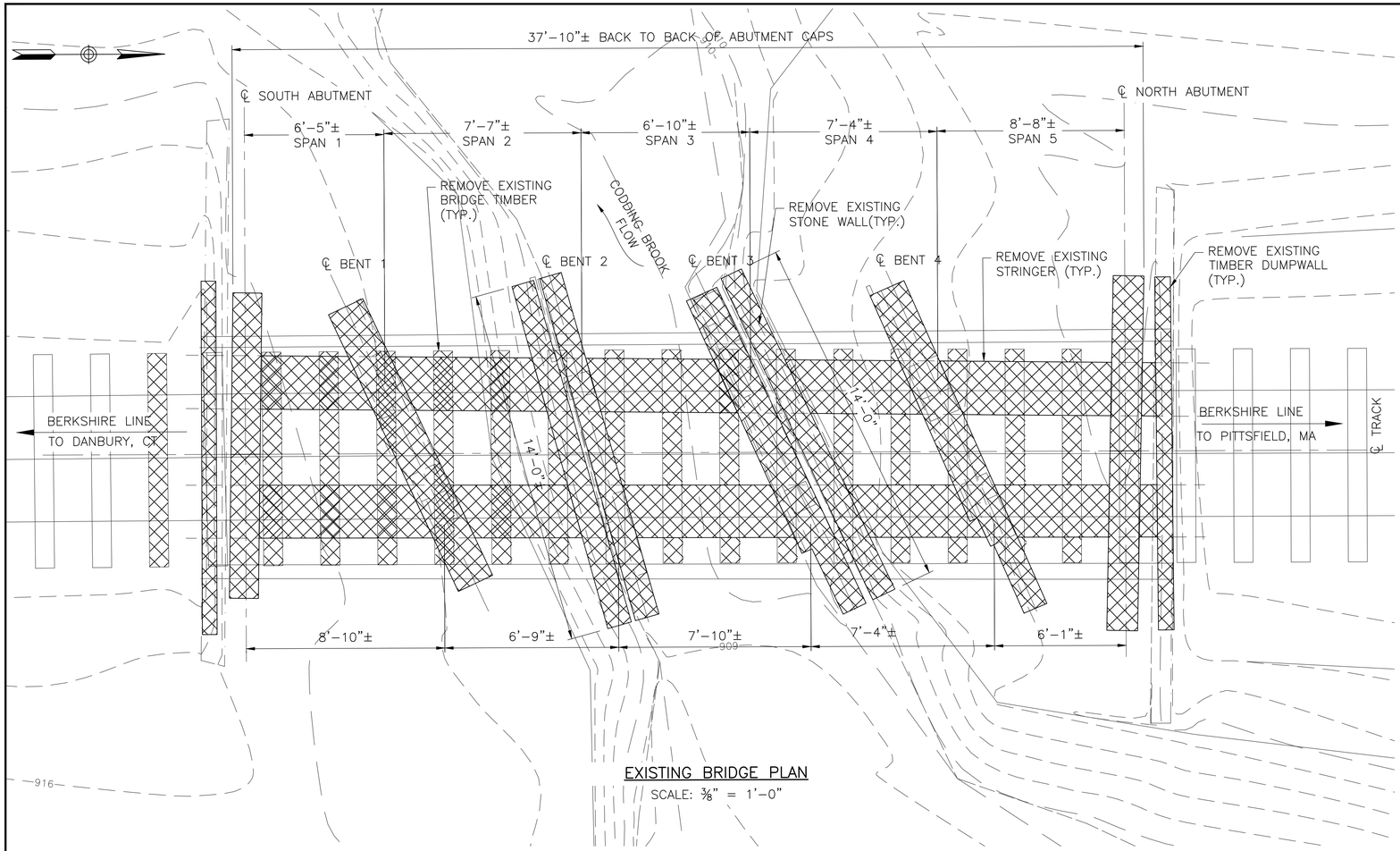
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
BORING SHEET 3 OF 3

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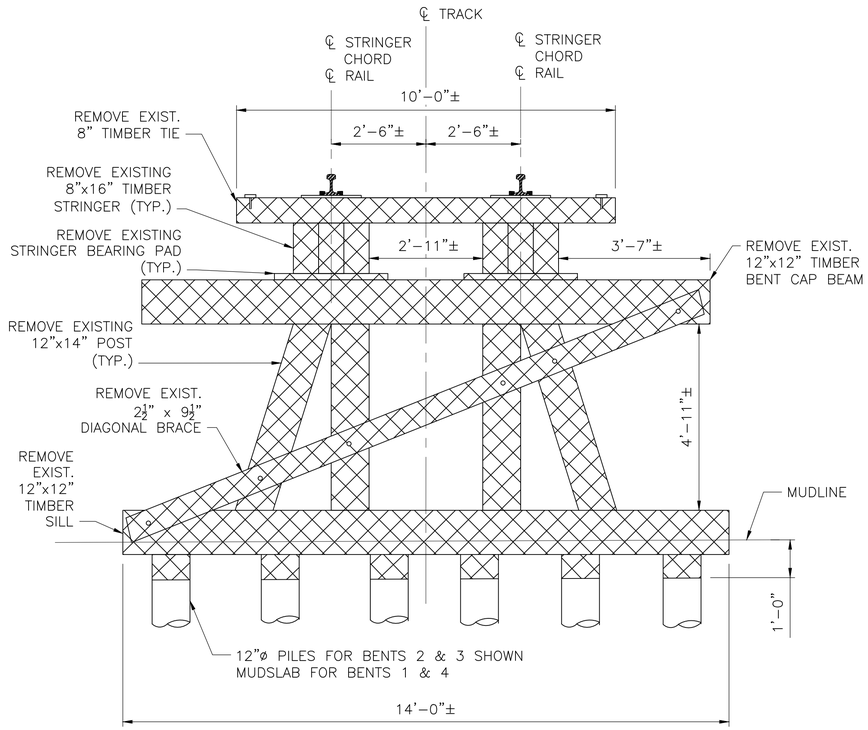
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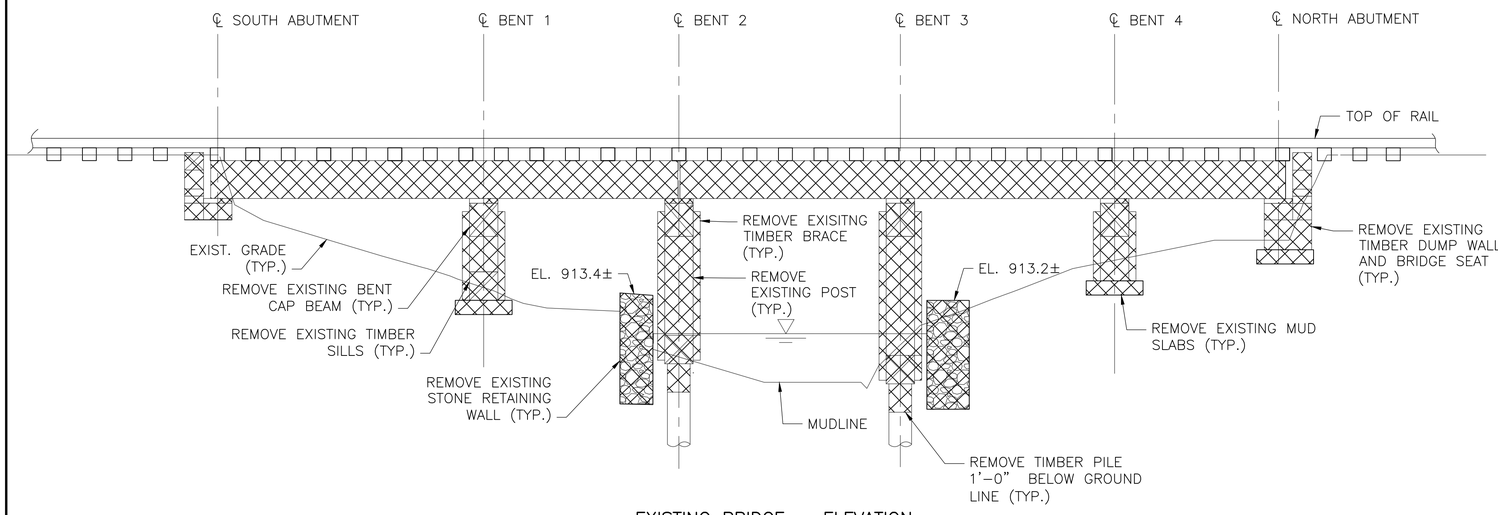
EXISTING BRIDGE PLAN

SCALE: ⅜" = 1'–0"



TYPICAL EXISTING BENT – ELEVATION

SCALE: ½" = 1'–0"



EXISTING BRIDGE – ELEVATION

SCALE: ⅜" = 1'–0"

LEGEND

EXISTING TIMBER STRUCTURE REMOVAL

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

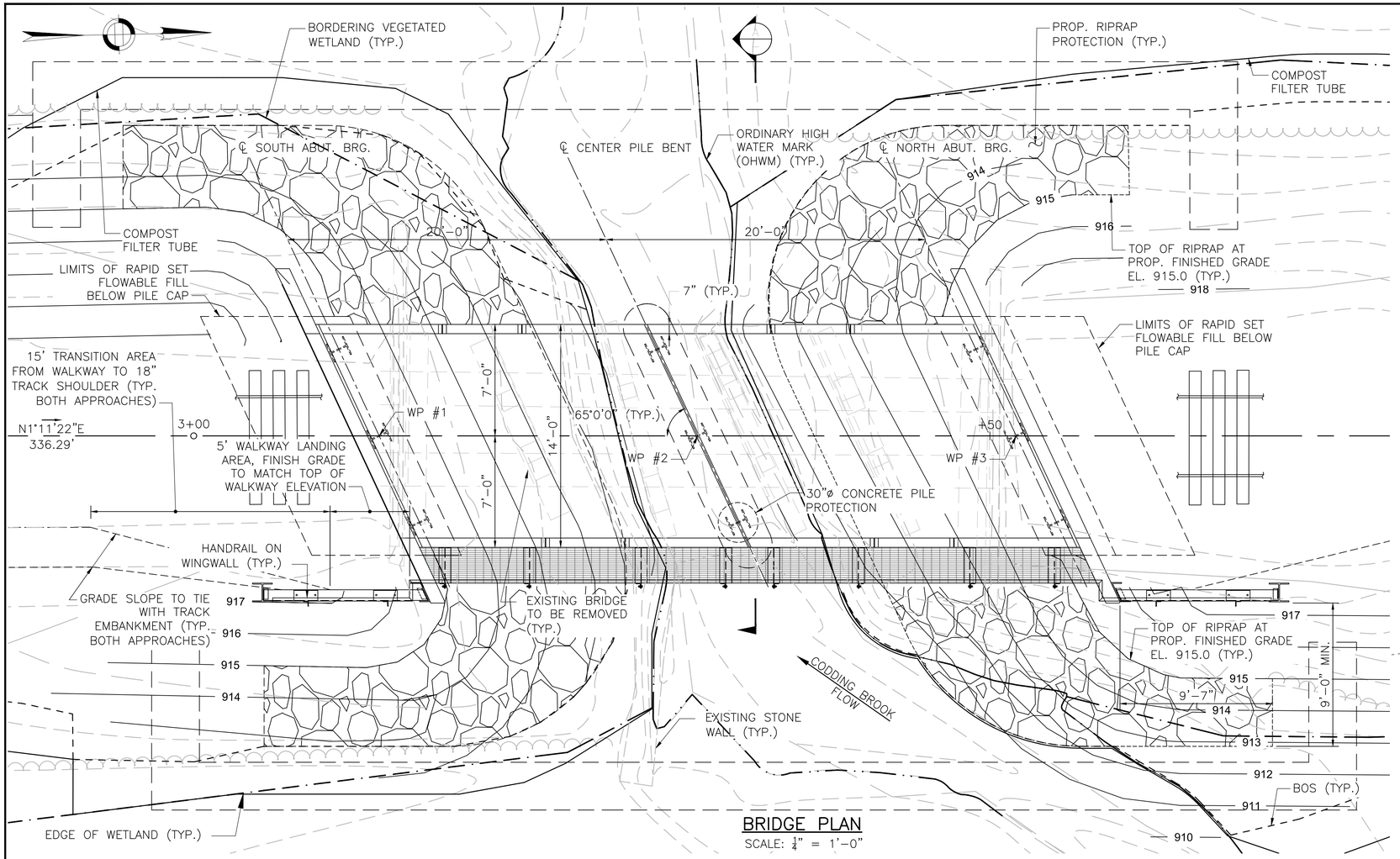
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
DEMOLITION LIMITS PLAN AND ELEVATION

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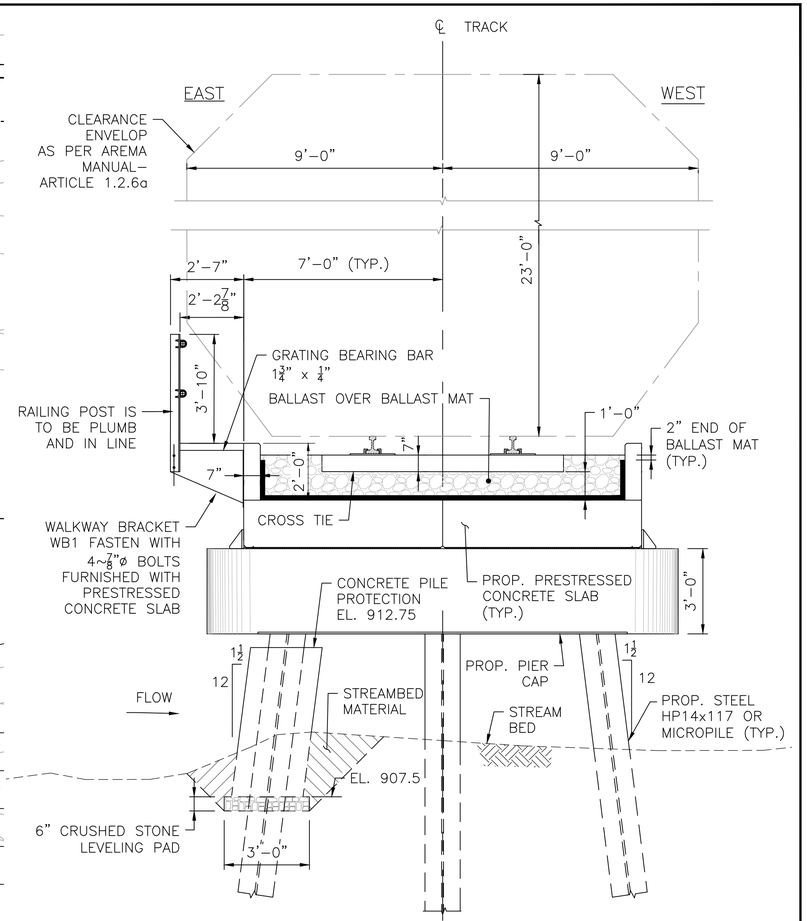
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BRIDGE PLAN

SCALE: ¼" = 1'-0"



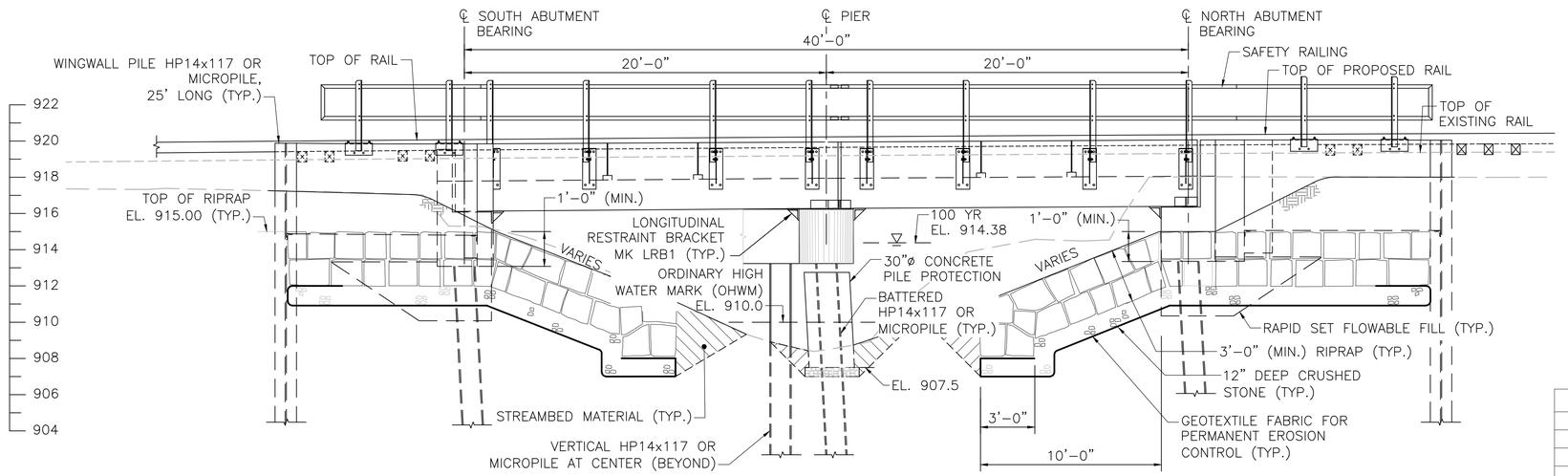
SECTION A

SCALE: ⅜" = 1'-0"

WP#	STATION	NORTHING	EASTING	ELEVATION (TOP OF RAIL)
1	3+11.65	2947956.4076	185237.1596	920.06'
2	3+31.65	2947976.4032	185237.5748	920.22'
3	3+51.65	2947996.3989	185237.9899	920.34'

NOTES:

1. GENERAL NOTES REFFER TO DWG NO. S-1.
2. W.P ELEVATIONS CORRESPOND TO THE ELEVATION OF THE TOP OF THE RAIL AT STATION INDICATED.
3. FILL GAP BETWEEN ENDS OF BEAMS AND FACE OF BACKWALL WITH PILES OF PREFORMED JOINT FILLER.
4. MICROPILE OPTION NOT SHOWN FOR CLARITY. SEE SHEET S-9A FOR DETAILS.



ELEVATION

SCALE: ¼" = 1'-0"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

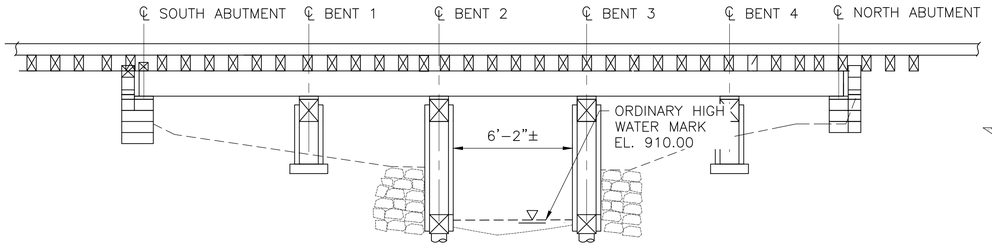
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PROPOSED BRIDGE PLAN & ELEVATION

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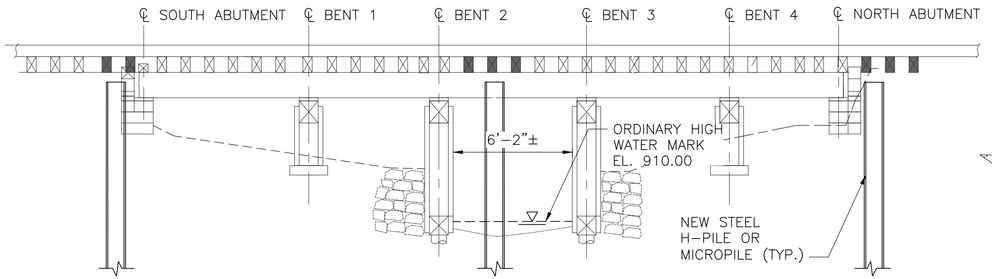
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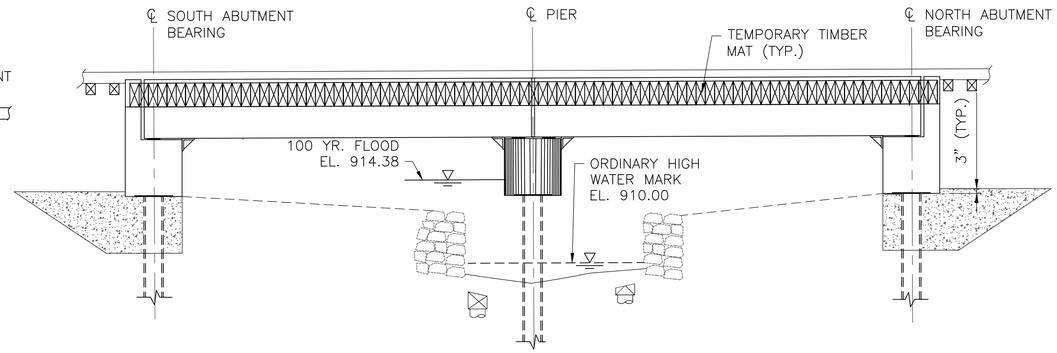
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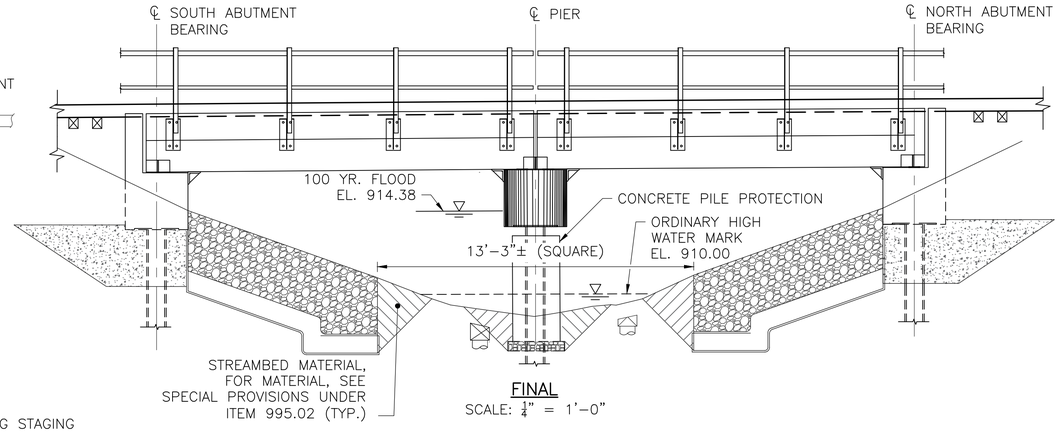
EXISTING
SCALE: $\frac{1}{4}$" = 1'-0"



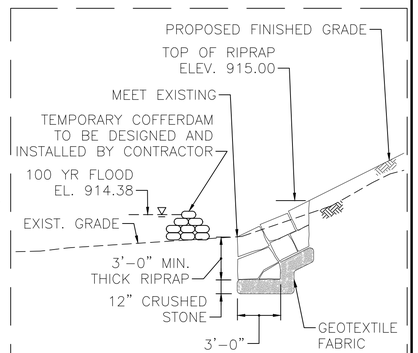
STAGE 1
SCALE: $\frac{1}{4}$" = 1'-0"



STAGE 3
SCALE: $\frac{1}{4}$" = 1'-0"



FINAL
SCALE: $\frac{1}{4}$" = 1'-0"



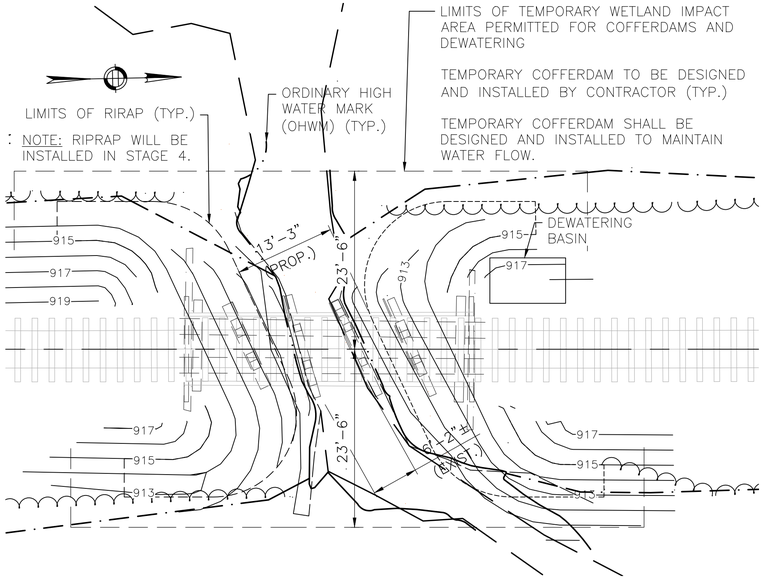
COFFERDAM DETAIL SECTION
SCALE: $\frac{3}{16}$" = 1'-0"

LEGEND:

TEMPORARY REMOVAL DURING STAGING

TEMPORARY SUPPORT NOTES:

1. TEMPORARY TRACK SUPPORT AT ABUTMENTS SHALL BE DESIGNED AND FABRICATED BY THE CONTRACTOR PRIOR TO CONSTRUCTION IN CASE EXISTING ABUTMENTS ARE DAMAGED DURING INSTALLATION OF PILES. DESIGN OF TEMPORARY SUPPORT SHALL BE STAMPED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS AND SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL BEFORE FABRICATION. COST OF TEMPORARY SUPPORT SHALL BE INCIDENTAL TO PILE INSTALLATION.
2. THE CONTRACTOR SHALL PROVIDE SUPPORTS FOR THE EXISTING SUBSTRUCTURES AND RETAINING WALLS DURING INSTALLATION OF PILES.



STAGE 2
TEMPORARY COFFERDAM PLAN
SCALE: 1" = 10'-0"

SUGGESTED CONSTRUCTION STAGING:

STAGE 1 – WORK WILL BE PERFORMED DURING WEEKEND CLOSURES

1. REMOVE EXISTING TIES TEMPORALLY TO FACILITATE INSTALLATION OF PILES.
2. INSTALL PILES FOR NEW STRUCTURE ONE PIER/ABUTMENT LOCATION AT A TIME.
3. REINSTALL TIES.

STAGE 2 – WORK WILL BE PERFORMED DURING NON-OPERATION HOURS

1. INSTALL COFFERDAM.

STAGE 3 – WORK WILL BE PERFORMED IN THREE CONSECUTIVE WEEKEND CLOSURES

STAGE 3A – WORK WILL BE PERFORMED DURING 1st WEEKEND CLOSURE

1. REMOVE EXISTING BRIDGE SUPERSTRUCTURE, TIMBER PIERS AND ABUTMENTS INCLUDING TIES AND RAILS.
2. EXCAVATE AT PROPOSED ABUTMENT CAPS TO PROVIDE ACCESS FOR FIELD WELDING.
3. INSTALL AND WELD NEW PRECAST ABUTMENT AND PIER CAPS TO PRE-INSTALLED PILES.
4. BACKFILL EXCAVATED AREAS AT ABUTMENT CAPS.
5. INSTALL BEARINGS AND BRIDGE SUPERSTRUCTURE AND WELD RESTRAINT BRACKETS MK LRB1.
6. INSTALL TEMPORARY TIMBER MAT AND RAILS ON BRIDGE.
7. INSTALL AND COMPACT TEMPORARY BACKFILL.
8. OPEN BRIDGE TO TRAIN SERVICE.

STAGE 3B – WORK WILL BE PERFORMED DURING 2nd WEEKEND CLOSURE

1. REMOVE EXISTING RAIL AND TIES AT BRIDGE AND APPROACHES.
2. EXCAVATE AT ABUTMENT CAPS FOR PLACEMENT OF RAPID SET FLOWABLE FILL.
3. INSTALL PRECAST WINGWALLS AND POUR RAPID SET FLOWABLE FILL
4. BACKFILL AFTER FLOWABLE FILL HARDENS
5. REINSTALL TRACK AND OPEN BRIDGE TO TRAIN SERVICE.

STAGE 3C – WORK WILL BE PERFORMED DURING 3rd WEEKEND CLOSURE

1. REMOVE TEMPORARY TIMBER MAT AND RAILS ON BRIDGE
2. PERFORM TRACK WORK AT BRIDGE APPROACHES.
3. INSTALL BALLAST MAT, BALLAST, CROSS TIES AND RAILS
4. OPEN BRIDGE TO TRAIN SERVICE.

STAGE 4 – WORK WILL BE PERFORMED DURING NON-OPERATION HOURS

1. REMOVE EXISTING RETAINING WALLS AND CUT TIMBER PILES AT 1 FOOT BELOW FINISH GRADE.
2. INSTALL CONCRETE PILE PROTECTION.
3. INSTALL RIPRAP.
4. INSTALL BRIDGE WALKWAY AND RAILING.
5. REMOVE COFFERDAM

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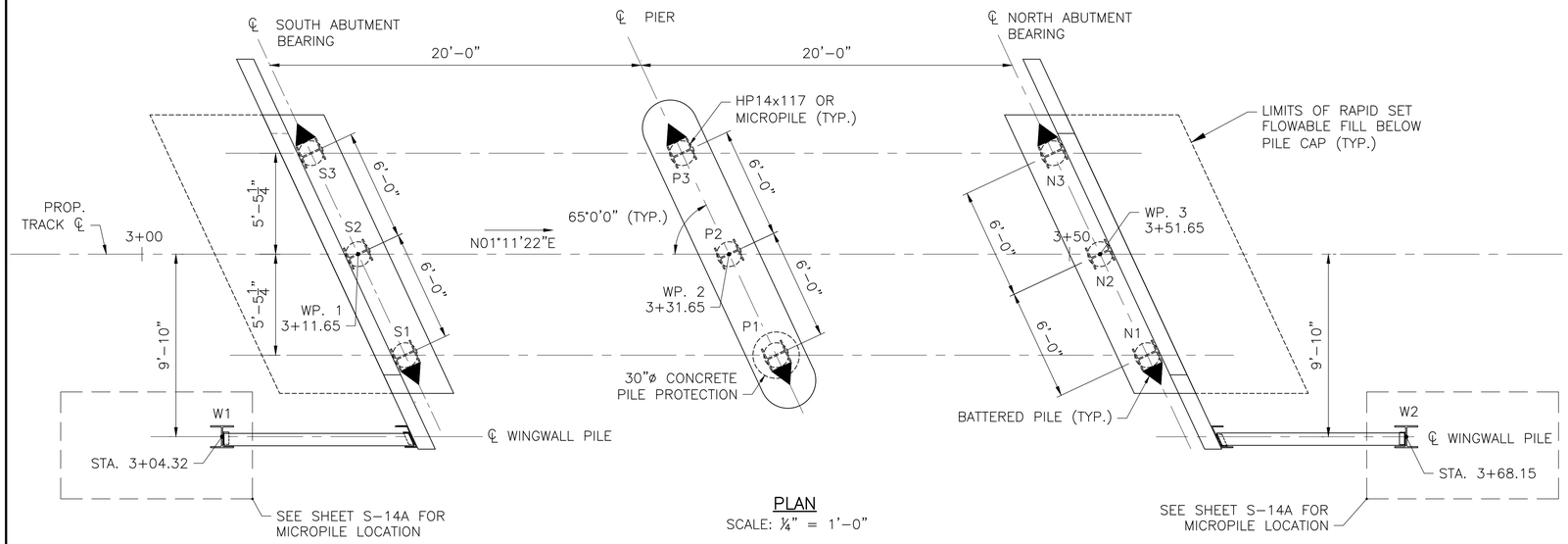
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
CONSTRUCTION STAGING

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

massDOT Massachusetts Department of Transportation Rail & Transit Division

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PLAN
SCALE: ¼" = 1'–0"

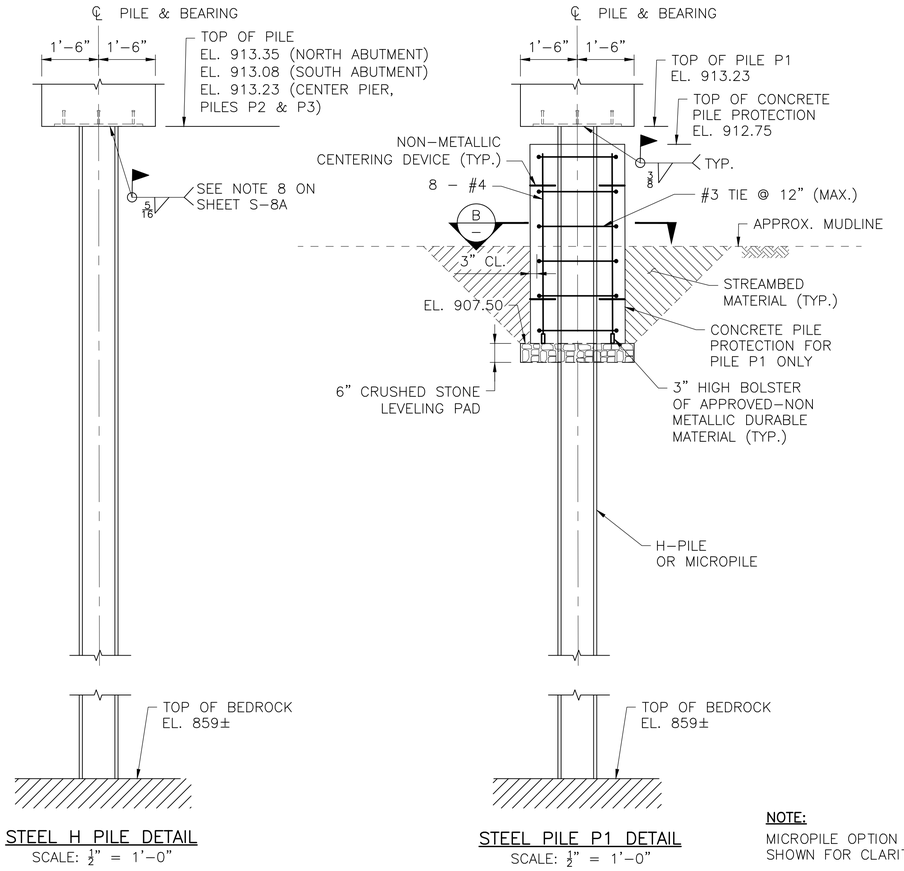
LIST OF PILES			
LOCATION	NO.	SIZE	ESTIMATED LENGTH (FT)
SOUTH ABUTMENT	S2	HP 14 X 117	55±
	S1 & S3	HP 14 X 117	
CENTER PIER BENT	P2	HP 14 X 117	
	P1 & P3	HP 14 X 117	
NORTH ABUTMENT	N2	HP 14 X 117	
	N1 & N3	HP 14 X 117	55±
WINGWALLS	W1 & W2	HP 14 X 117	25

NOTES:

1. ESTIMATED PILE LENGTHS SHOWN IN THE TABLE ABOVE ARE BASED ON INFORMATION FROM BORINGS. FINAL PILE LENGTHS ARE EXPECTED TO VARY BASED ON DRIVING CONDITIONS AND THE RESULTS OF DYNAMIC PILE TESTING.
2. HIGHEST ALLOWABLE TIP ELEVATION FOR DRIVEN ABUTMENT AND PIER PILES IS 16 FEET BELOW THE TOP OF GLACIAL TILL OR THE ELEVATIONS LISTED BELOW, WHICHEVER IS DEEPER:
   – SOUTH ABUTMENT: EL. 894
   – CENTER PIER: EL. 878
   – NORTH ABUTMENT: EL. 888
   DRIVEN PILES ARE ANTICIPATED TO BE DRIVEN DEEPER INTO THE GLACIAL TILL OR TO THE TOP OF BEDROCK TO DEVELOP THE REQUIRED ULTIMATE RESISTANCE.
3. HIGHEST ALLOWABLE TIP ELEVATION FOR DRIVEN WINGWALL PILES IS 25 FEET BELOW THE TOP OF WINGWALL:
   – SOUTHEAST WINGWALL: EL. 894.6
   – NORTHEAST WINGWALL: EL. 894.8
   DRIVEN WINGWALL PILES DO NOT HAVE A REQUIRED ULTIMATE RESISTANCE.
4. THE AXIAL DESIGN LOAD PER PILE FOR ABUTMENT AND PIER PILES IS 340.0 KIPS AS PER AREMA SERVICE LOAD DESIGN GROUP I LOAD COMBINATION.
5. THE ALLOWABLE STRUCTURAL PILE RESISTANCE IS 509.8 KIPS.
6. HEAVY DUTY PILE SHOES SHALL BE INSTALLED ON THE TIPS OF ALL PILES. PREFABRICATED PILE SHOES MAY BE USED IF APPROVED BY THE ENGINEER.
7. DETERMINATION OF THE DRIVEN PILE RESISTANCE, PILE DRIVING CRITERIA, AND PILE INTEGRITY SHALL BE PERFORMED USING THE PILE DRIVING ANALYZER (PDA) WITH SIGNAL MATCHING. PILES SHALL BE INSTALLED TO ACHIEVE AN ULTIMATE DRIVEN RESISTANCE EQUAL TO OR GREATER THAN 2.25 TIMES THE MAXIMUM SERVICE AXIAL DESIGN LOAD. A MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER ENGAGED BY THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THE PDA TESTING IN ACCORDANCE WITH SECTION 940 OF THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES, 2022 EDITION.
8. THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE DRIVING/TESTING PLAN FOR REVIEW AND APPROVAL OF THE ENGINEER.
9. PILE DRIVING TESTING SHALL BE PERFORMED BY CONTRACTOR ON A LEAST ONE ABUTMENT PILE ON EACH SIDE, ONE BATTERED PIER PILE, AND ONE VERTICAL PIER PILE FOR A TOTAL OF AT LEAST 4 PILES.
10. PILES SHALL BE DRIVEN IN ACCORDANCE WITH SECTION 940 OF THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, 2022 EDITION, AND THE REQUIREMENTS SHOWN ON THE DRAWINGS. IN THE EVENT OF A CONFLICT, THE NOTES ON THE DRAWING GOVERN.
11. PILES SHALL CONFORM TO ASTM A572, GRADE 50.
12. PILES SHALL BE COATED WITH COAL TAR EPOXY COATING BEFORE DRIVING. THE COAL TAR EPOXY COATING SHALL EXTEND AT LEAST 15 FEET BELOW THE FINAL GRADE. TOUCH UP COAL TAR EPOXY AT TOP OF PILE AFTER WELDING.
13. SEE SHEET S–9A FOR DETAILS FOR MICROPILE OPTION.

REQUIRED PILE LOCATION TOLERANCES:

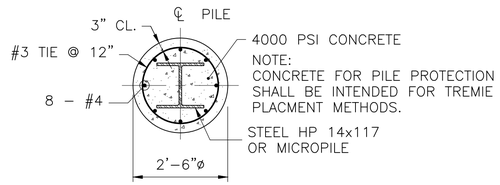
1. CONFORMANCE TO THE FOLLOWING TOLERANCES IS OF EXTREME IMPORTANCE TO FOUNDATIONS OF THIS TYPE.
2. PRIOR TO DRIVING, EACH PILE SHALL BE HELD BY TEMPLATE TO WITHIN 1" OF PLAN LOCATION.
3. AFTER EACH PILE IS DRIVEN, THE TOP OF THE PILE SHALL BE WITHIN 3" OF PLAN LOCATION.



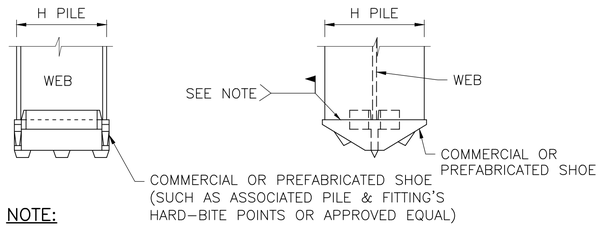
STEEL H PILE DETAIL
SCALE: ½" = 1'–0"

STEEL PILE P1 DETAIL
SCALE: ½" = 1'–0"

NOTE:
MICROPILE OPTION NOT SHOWN FOR CLARITY.



SECTION B
SCALE: ½" = 1'–0"



NOTE:
THE SHOE WELD JOINT DESIGN SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION AND AS SHOWN ON THE APPROVED WELDING PROCEDURE SPECIFICATIONS.

STEEL H–PILE SHOE
NOT TO SCALE

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

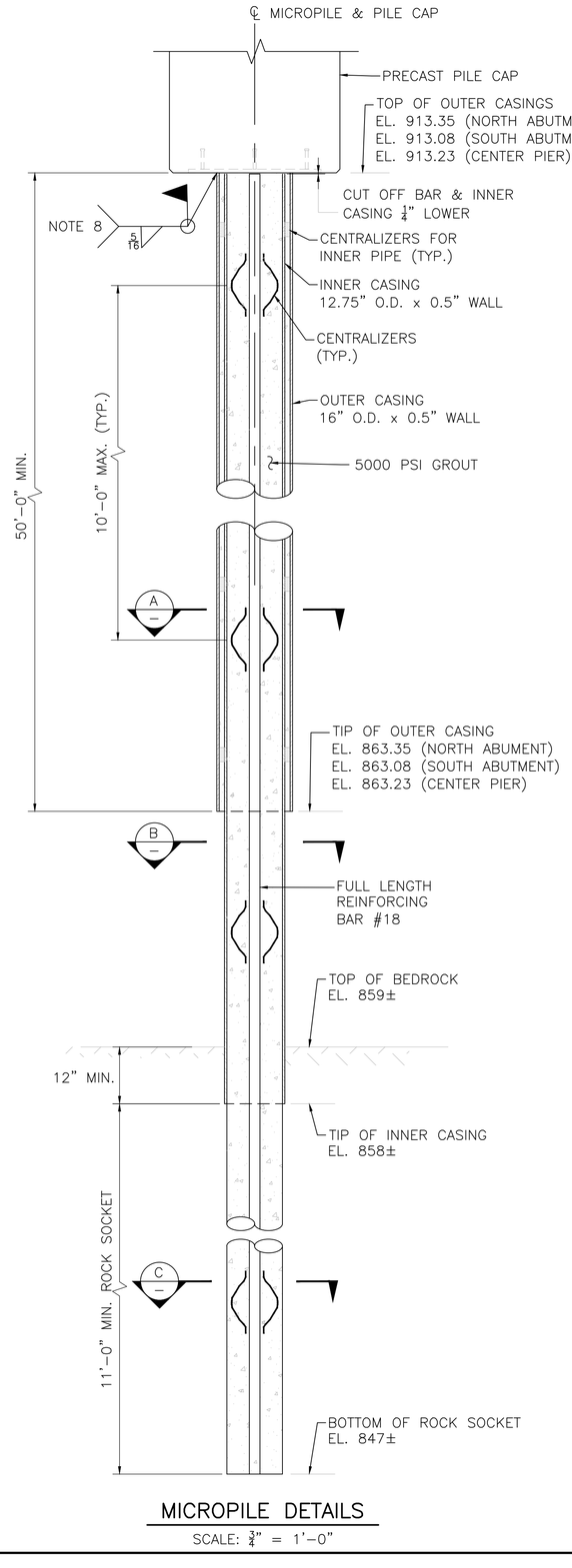
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
FOUNDATION LAYOUT DETAILS

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BOSTON, MA 02110
(617) 357-7700

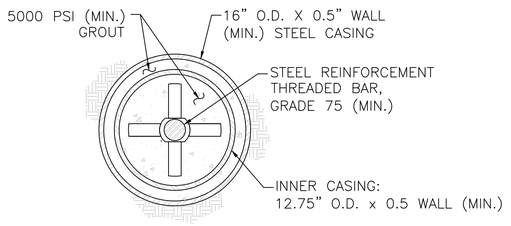
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MICROPILE DETAILS

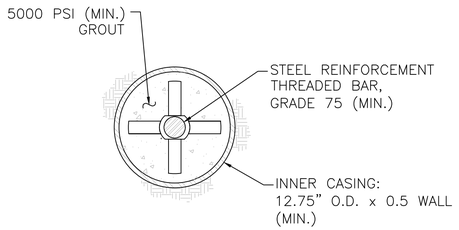
SCALE: ¾" = 1'-0"



CENTRALIZER BETWEEN CASINGS NOT SHOWN FOR CLARITY.

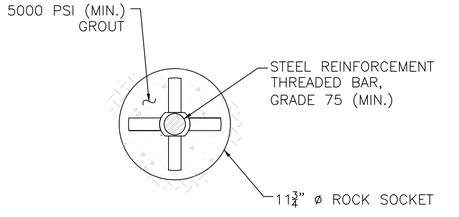
SECTION A

SCALE: 1½" = 1'-0"



SECTION B

SCALE: 1½" = 1'-0"



SECTION C

SCALE: 1½" = 1'-0"

LIST OF MICROPILES			
LOCATION	NO.	INNER CASING SIZE	* ESTIMATED LENGTH (FT)
SOUTH ABUTMENT	S2	12.75"ø x ½"	66±
	S1 & S3	12.75"ø x ½"	
CENTER PIER BENT	P2	12.75"ø x ½"	
	P1 & P3	12.75"ø x ½"	
NORTH ABUTMENT	N2	12.75"ø x ½"	
	N1 & N3	12.75"ø x ½"	66±

* INCLUDING 11' ROCK SOCKET

MICROPILE NOTES:

1. GROUT SHALL BE A NEAT CEMENT GROUT WITH A MINIMUM 3-DAY UNCONFINED COMPRESSIVE STRENGTH OF 2,500 PSI AND A MINIMUM 28-DAY UNCONFINED COMPRESSIVE STRENGTH OF 5,000 PSI. THE GROUT SHALL CONFORM TO AASHTO T106/ASTM C109.
2. ALL PERMANENT STEEL OUTER PIPE CASINGS SHALL BE NEW PRIME STEEL MEETING THE REQUIREMENTS OF ASTM A252, GRADE 3. FOR INNER PIPE, CASINGS SHALL BE NEW PRIME STEEL MEETING THE REQUIREMENTS OF ASTM A252, GRADE 3, OR API 5L PSL1, GRADE 52 WITH SR15 SUPPLEMENTAL REQUIREMENTS.
3. NO THREADED OUTER CASING JOINTS SHALL BE LOCATED WITHIN 8 FEET OF THE PILE CAP. JOINTS IN INNER CASING SHALL BE STAGGERED AT 5'-0"±6" FROM JOINTS IN OUTER CASING.
4. THREADED BARS SHALL BE ASTM A615, GRADE 75, AND SHALL BE JOINED WITH COUPLERS SUPPLIED BY THE MANUFACTURER. THE COUPLERS SHALL BE CAPABLE OF DEVELOPING OR EXCEEDING THE STRENGTH OF THE THREAD BAR.
5. THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE TESTING PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER.
6. MICROPILES SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH SPECIAL PROVISIONS ITEM 945.10 DRILLED MICROPILES.
7. THE AXIAL DESIGN LOAD PER PILE FOR ABUTMENT AND PIER PILES IS 340.0 KIPS AS PER AREMA SERVICE LOAD DESIGN GROUP I LOAD COMBINATION.
8. THE CONTRACTOR SHALL SUBMIT WELDING PROCEDURE AS A PART OF SUPERSTRUCTURE ERECTION PROCEDURE FOR ENGINEER'S REVIEW. THE WELDING PROCEDURE SHOULD COVER POSSIBLE FIELD CONDITIONS SUCH AS THE TOP OF PILES MAY BE CUT OFF LOWER THAN ELEVATIONS INDICATED ON PLANS. MEASUREMENTS FOR CONTROL OF HEAT GENERATED DURING WELDING TO AVOID DAMAGING SURROUNDING PRECAST CONCRETE DUE TO THERMAL EXPANSION IN EMBEDDED STEEL PLATES SHALL BE INCLUDED IN THE PROCEDURE.
9. CONCRETE PILE PROTECTION FOR PILE P1, SEE SHEET S-9.

REQUIRED PILE LOCATION TORERANCES:

1. CONFORMANCE TO THE FOLLOWING TOLERANCES IS OF EXTREME IMPORTANCE TO FOUNDATIONS OF THIS TYPE.
2. PRIOR TO DRILLING, EACH PILE SHALL BE HELD BY TEMPLATE TO WITHIN 1" OF PLAN LOCATION.
3. AFTER EACH PILE IS INSTALLED, THE TOP OF THE PILE SHALL BE WITHIN 2" OF PLAN LOCATION.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

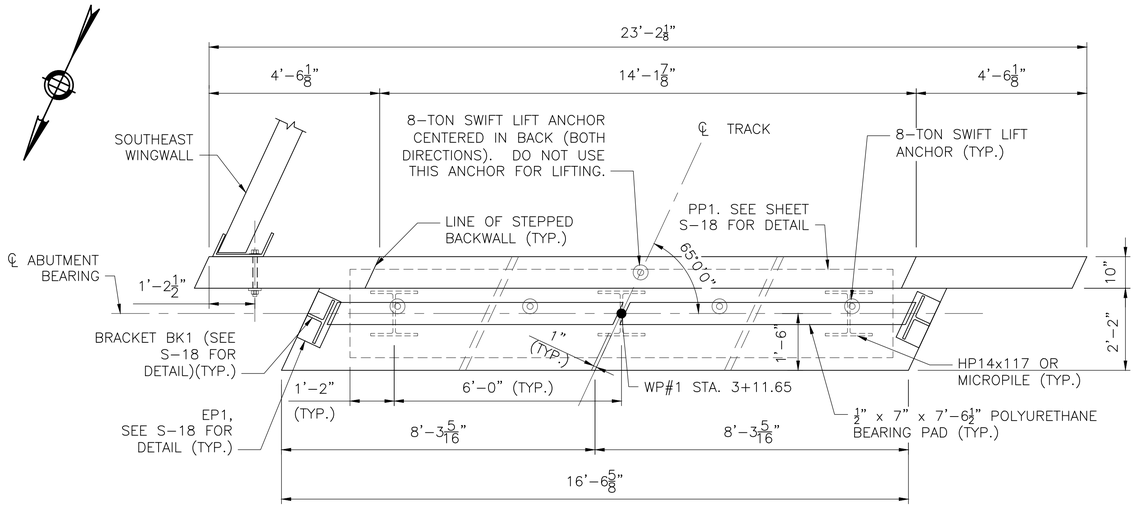
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
DETAILS FOR MICROPILE OPTION

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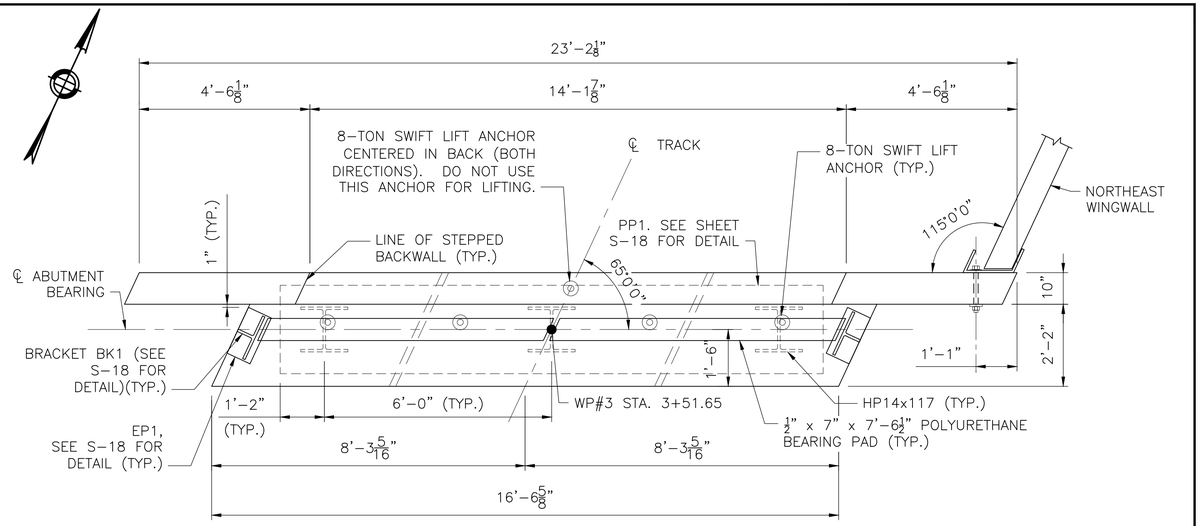
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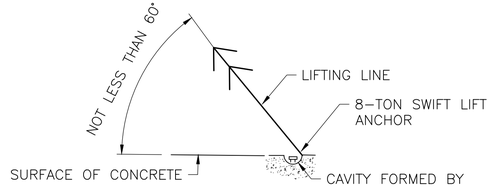
SOUTH ABUTMENT PLAN

SCALE: 1/2" = 1'-0"



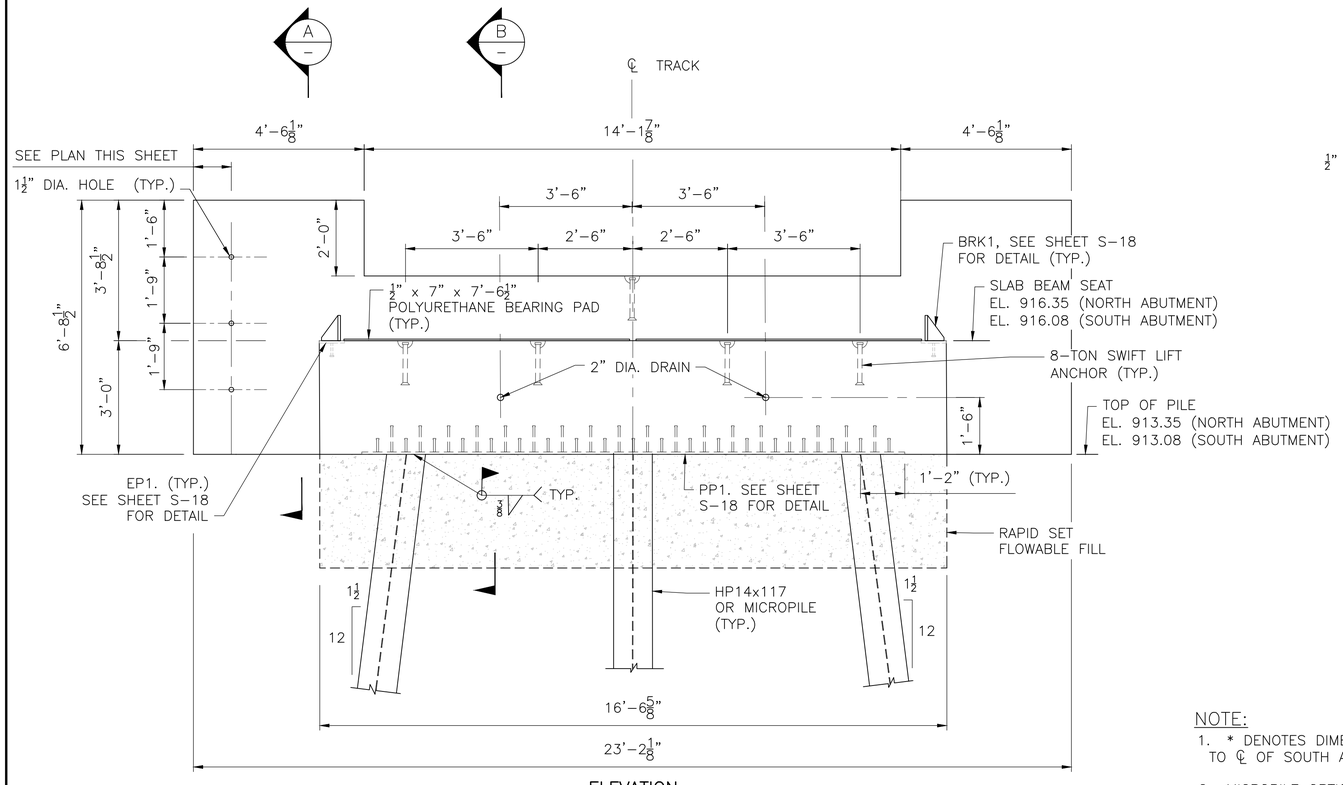
NORTH ABUTMENT PLAN

SCALE: 1/2" = 1'-0"



LIFTING DETAIL

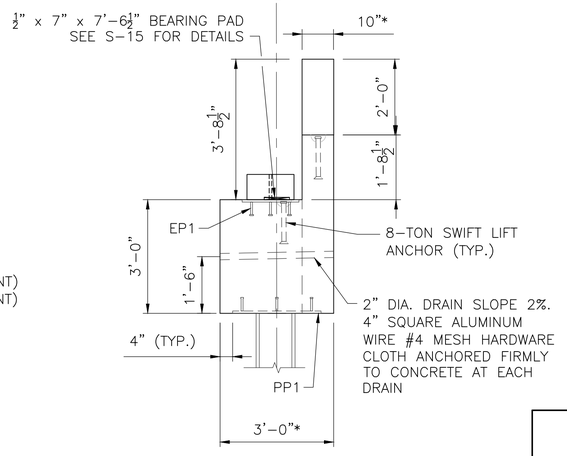
N.T.S.



ELEVATION

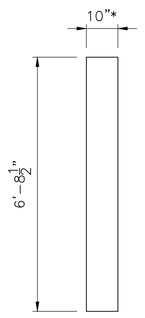
SCALE: 1/2" = 1'-0"

(SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR)
(FOR ORIENTATION SEE PROPOSED BRIDGE PLAN & ELEVATION)



SECTION B

SCALE: 1/2" = 1'-0"



SECTION A

SCALE: 1/2" = 1'-0"

NOTE:

1. * DENOTES DIMENSIONS MEASURED PERPENDICULAR TO ℄ OF SOUTH ABUTMENT BEARING
2. MICROPILE OPTION NOT SHOWN FOR CLARITY.

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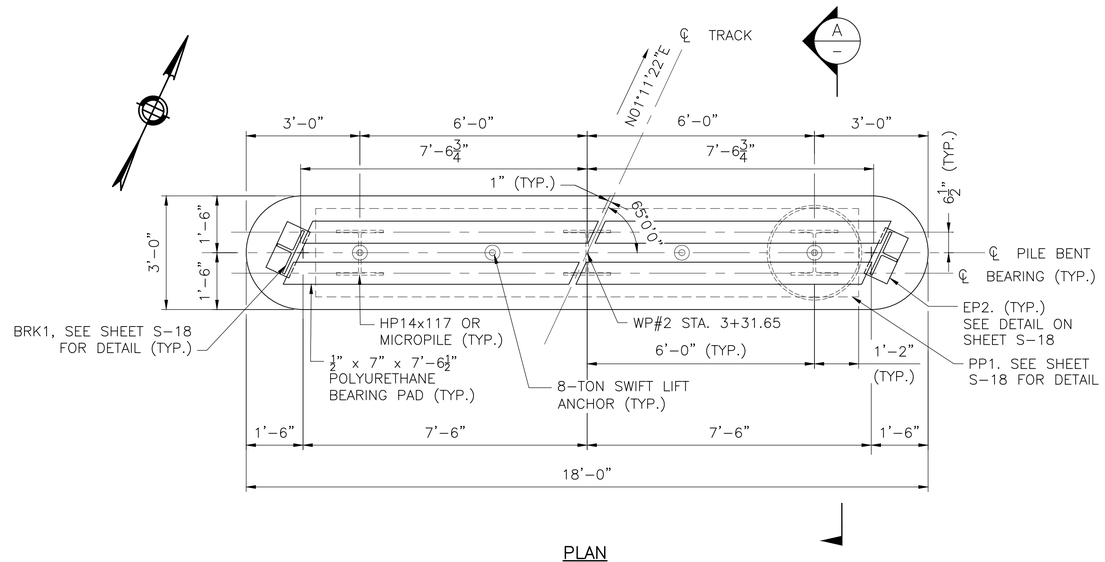
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
ABUTMENT LAYOUT DETAILS

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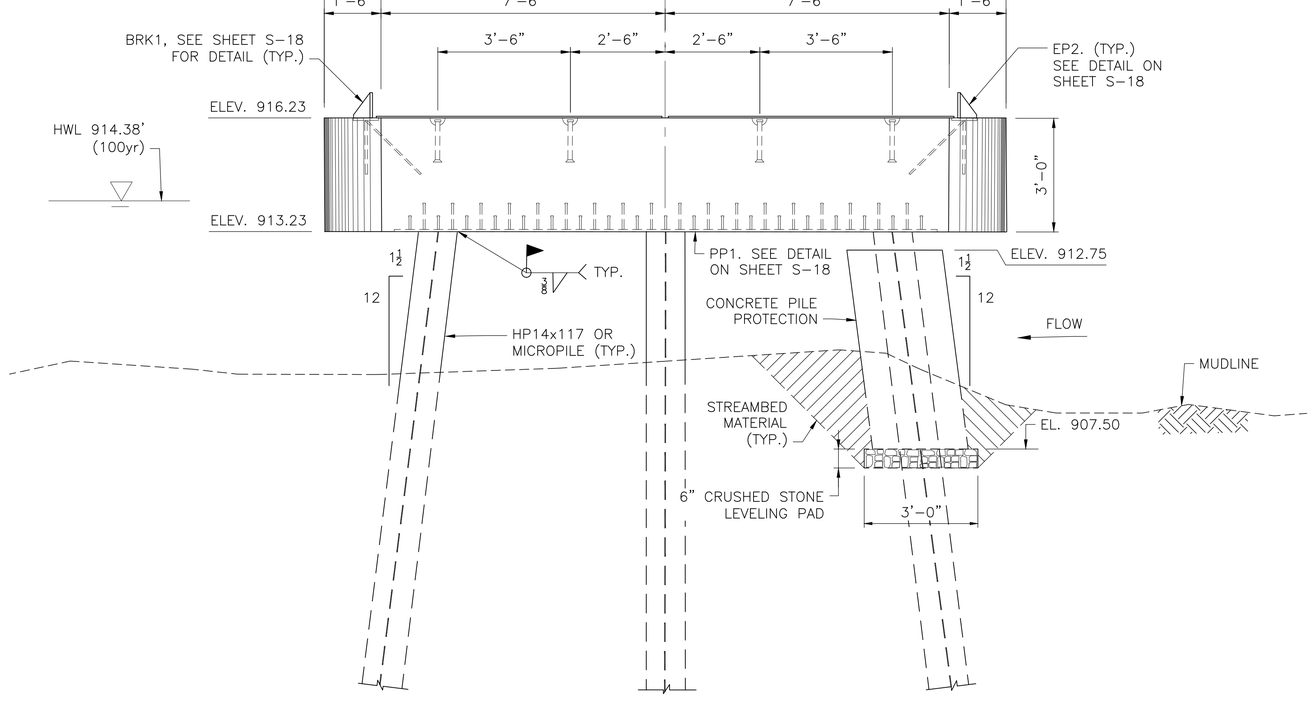
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PLAN

SCALE: ½" = 1'–0"

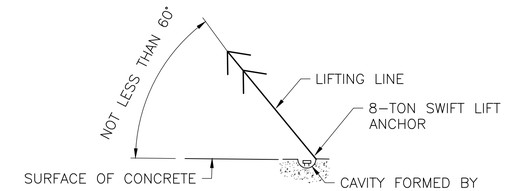
(FOR ORIENTATION SEE PROPOSED BRIDGE PLAN & ELEVATION SHEET)



ELEVATION

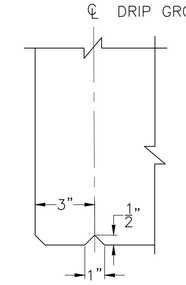
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(FOR ORIENTATION SEE PROPOSED BRIDGE PLAN & ELEVATION SHEET)



LIFTING DETAIL

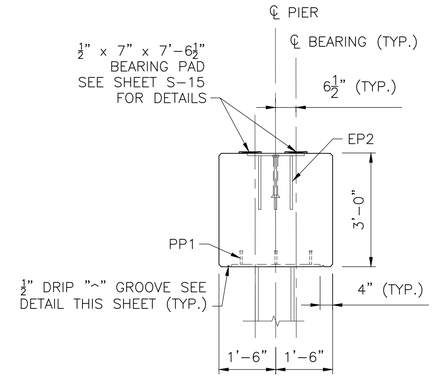
N.T.S.



DRIP GROOVE DETAIL

SCALE: N.T.S.

(REINFORCING NOT SHOWN FOR CLARITY)



SECTION A

SCALE: ½" = 1'–0"

NOTES:

MICROPILE OPTION NOT SHOWN FOR CLARITY.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

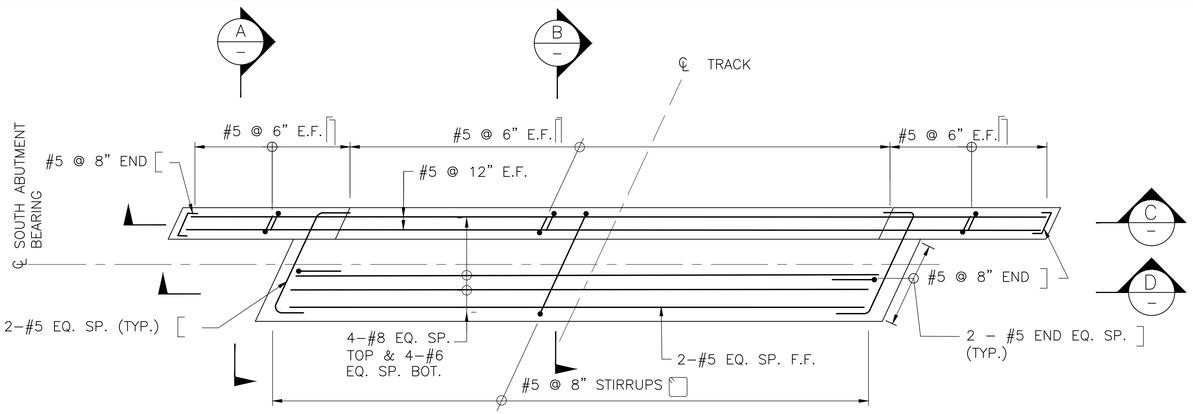
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PIER LAYOUT DETAILS

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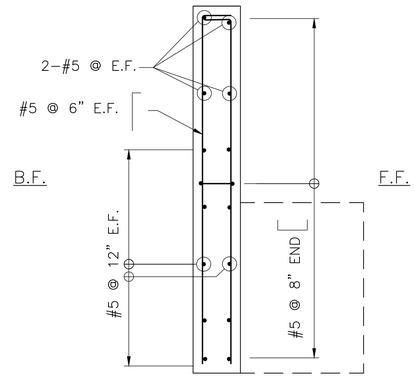
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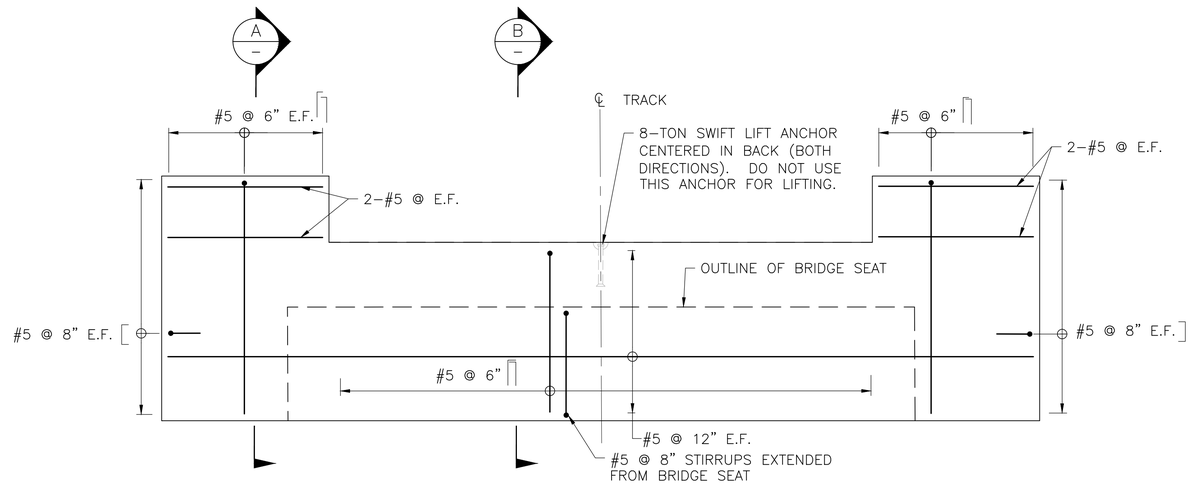
SOUTH ABUTMENT REINFORCING PLAN

SCALE: $\frac{1}{2}$" = 1'–0"
(SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR)



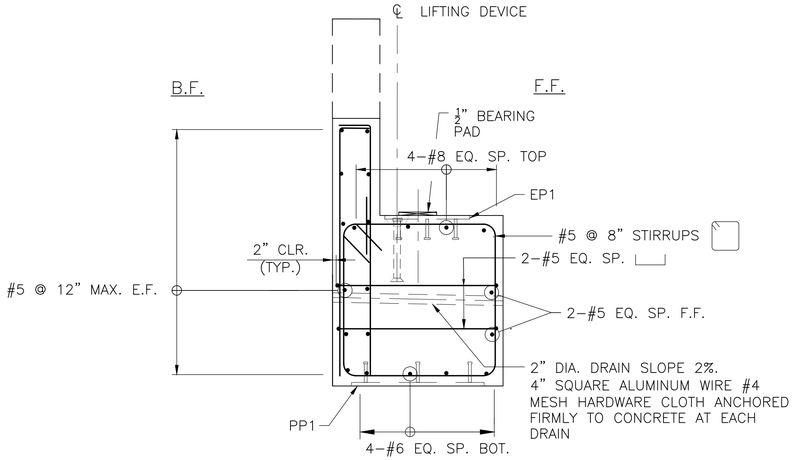
SECTION A–A

SCALE: $\frac{3}{4}$" = 1'–0"



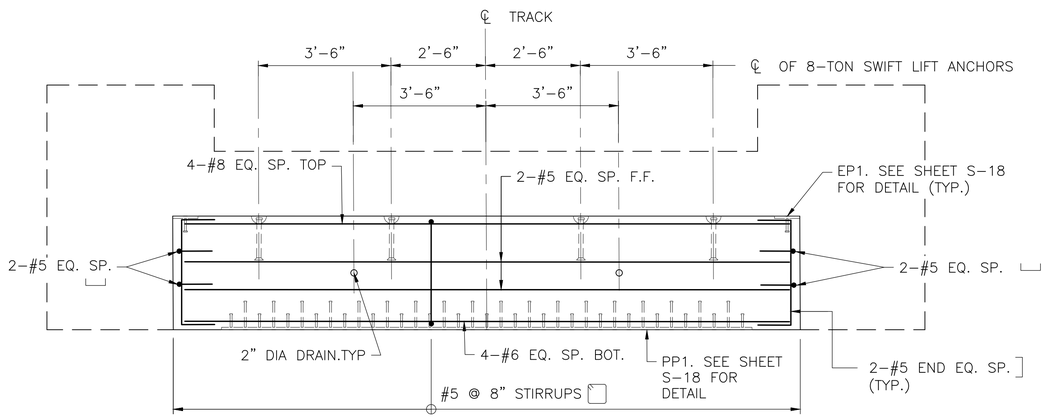
SECTION C – BACKWALL REINFORCING

SCALE: $\frac{1}{2}$" = 1'–0"
(SOUTH ABUTMENT R/F SHOWN, NORTH ABUTMENT R/F SIMILAR)



SECTION B–B

SCALE: $\frac{3}{4}$" = 1'–0"



SECTION D – BRIDGE SEAT REINFORCING

SCALE: $\frac{1}{2}$" = 1'–0"
(SOUTH ABUTMENT R/F SHOWN, NORTH ABUTMENT R/F SIMILAR)

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

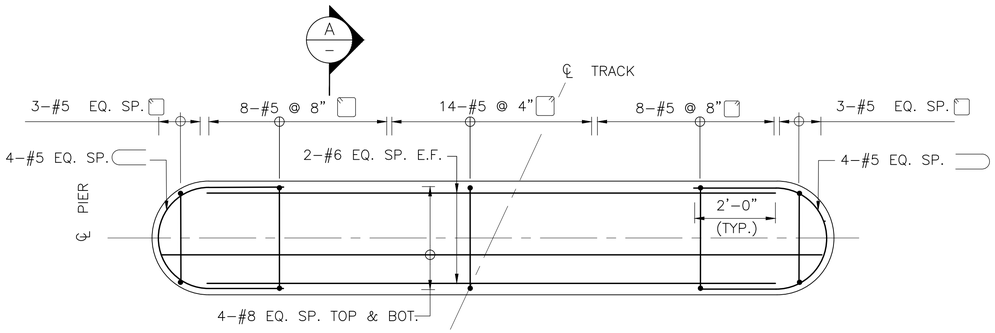
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE BRIDGE 77.04 - CODDING BROOK BRIDGE ABUTMENT CAP REINFORCEMENT DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

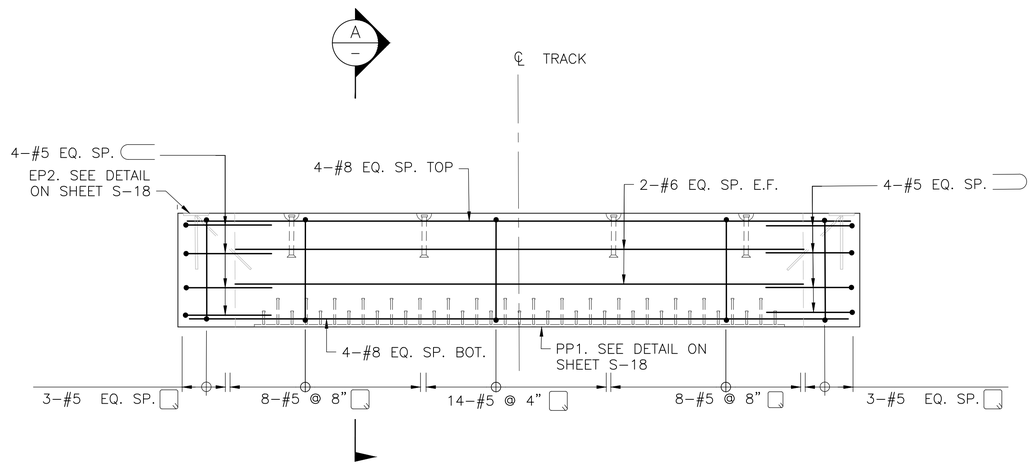
HDR, INC.
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BOSTON, MA 02110
(617) 307-7700

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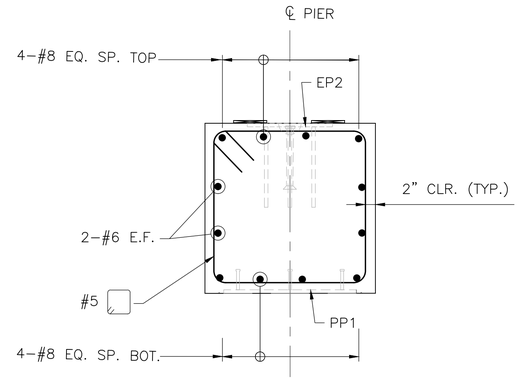
SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	A.T.	E.Y.	SSL	SHEET: S–12	



PRECAST CAP PLAN
SCALE: $\frac{1}{2}$” = 1’–0”



PRECAST CAP ELEVATION
SCALE: $\frac{1}{2}$” = 1’–0”



SECTION A–A
SCALE: $\frac{3}{4}$” = 1’–0”

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

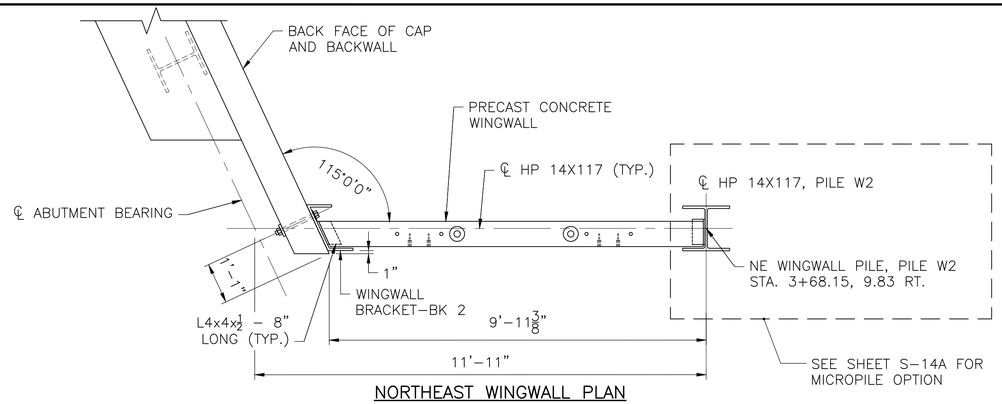
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PIER CAP REINFORCEMENT DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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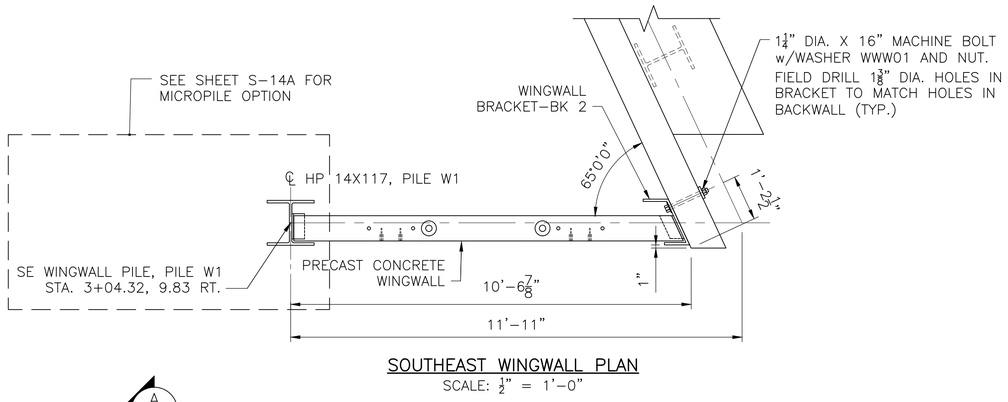
massDOT Massachusetts Department of Transportation Rail & Transit Division

SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	A.T.	E.Y.	SSL	SHEET: S–13	



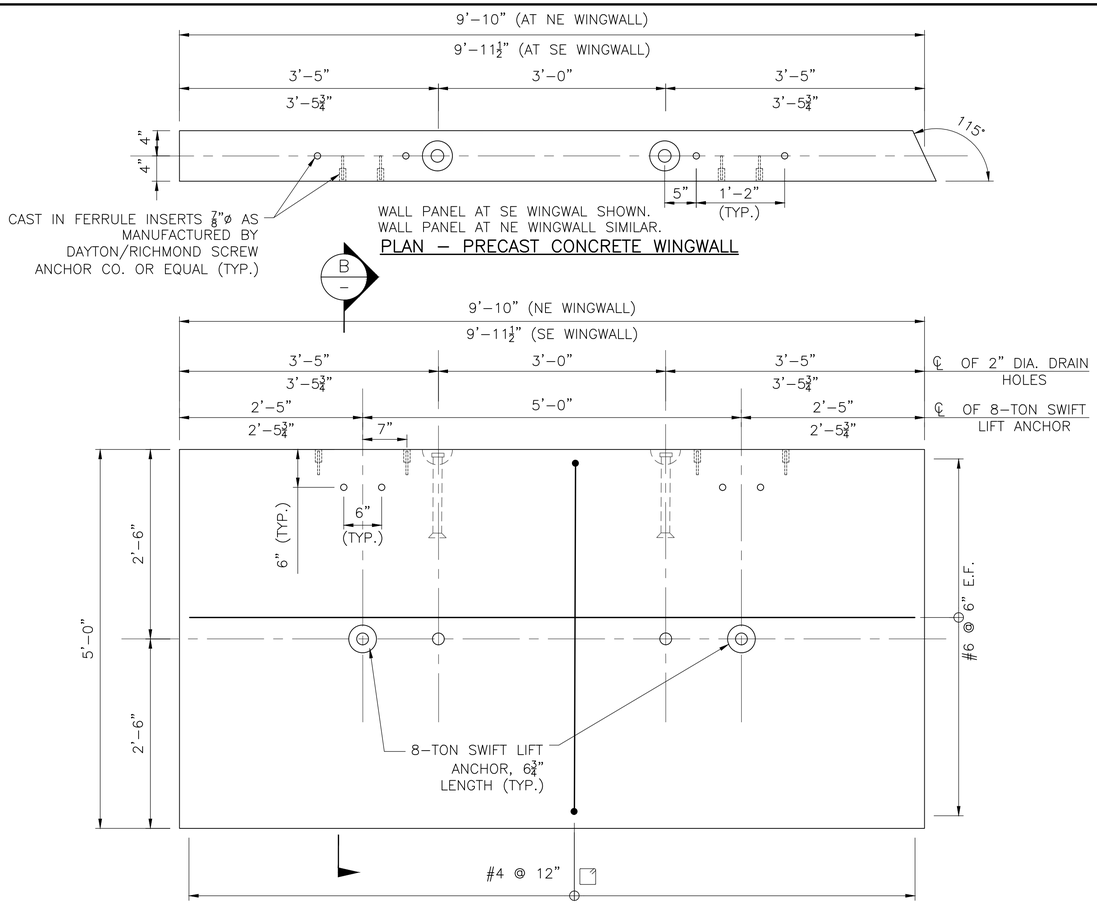
NORTHEAST WINGWALL PLAN

SCALE: ½" = 1'–0"



SOUTHEAST WINGWALL PLAN

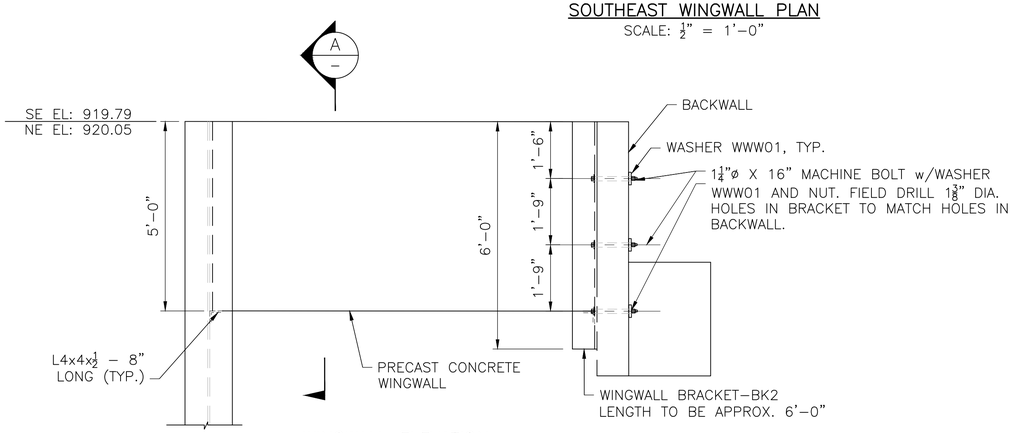
SCALE: ½" = 1'–0"



PLAN – PRECAST CONCRETE WINGWALL

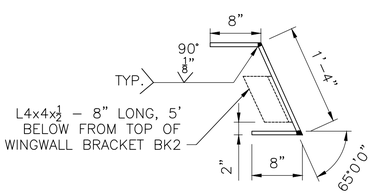
PRECAST CONCRETE WINGWALL

SCALE: 1" = 1'–0"



WINGWALL ELEVATION

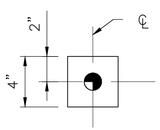
SCALE: ½" = 1'–0"



WINGWALL BRACKET BK2

SCALE: 1" = 1'–0"

THICKNESS = ¾"



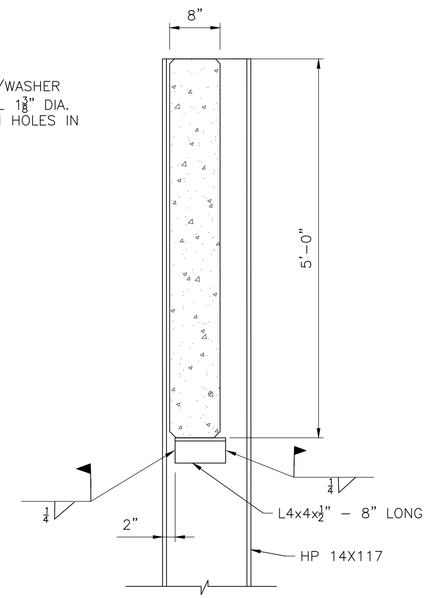
WASHER MK WWW01

N.T.S.

1~BAR 4" X ¾" X 4"

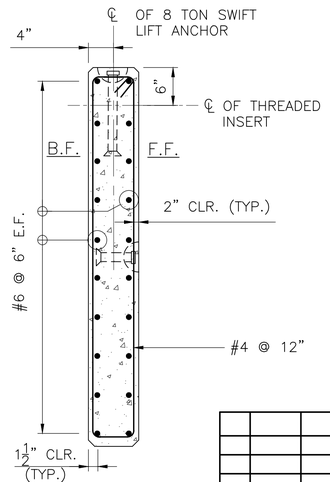
WEIGHT =3.4 LBS.

GALVANIZE AFTER FABRICATION



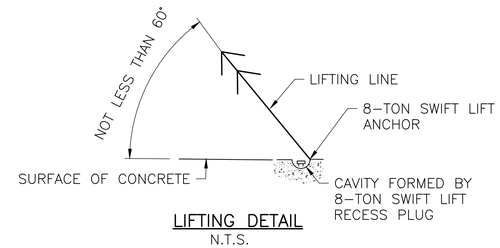
SECTION A

SCALE: 1" = 1'–0"



SECTION B

SCALE: 1" = 1'–0"



LIFTING DETAIL

N.T.S.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

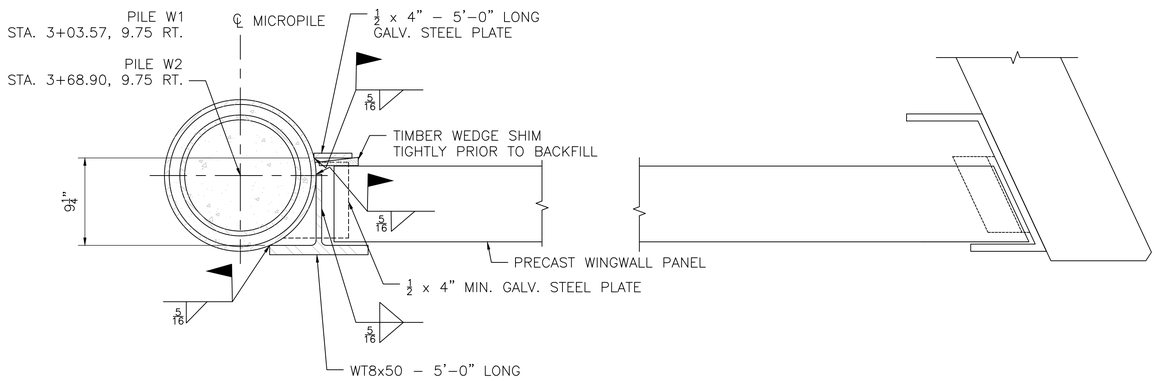
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
WINGWALL LAYOUT AND
REINFORCEMENT DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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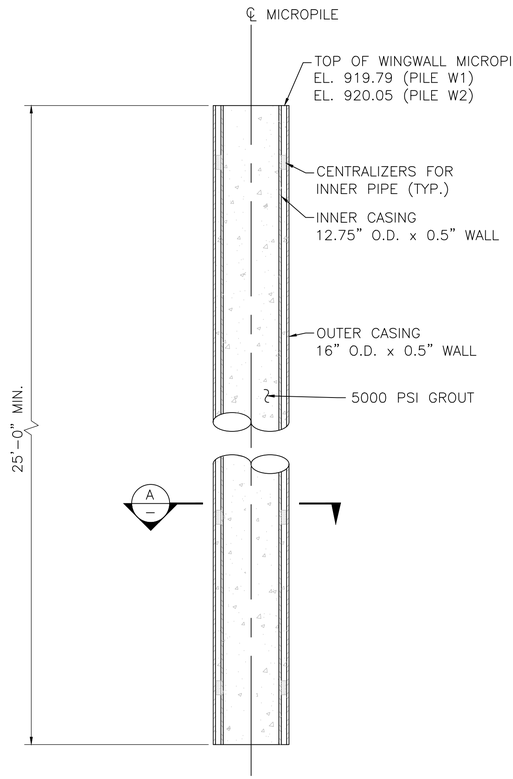
SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	A.T.	E.Y.	SSL	SHEET: S–14	



NOTE: TOUCH UP WITH ZINC–RICH PRIMER AFTER WELDING.

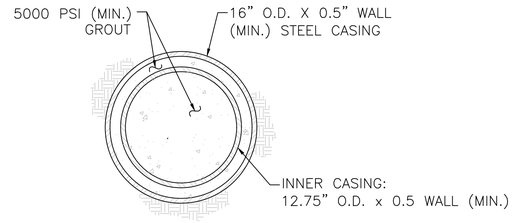
WINGWALL MICROPILE CONNECTION

SCALE: 1½" = 1'–0"



MICROPILE W1 & W2 DETAILS

SCALE: ¾" = 1'–0"



CENTRALIZER BETWEEN CASINGS NOT SHOWN FOR CLARITY.

SECTION A – / SCALE: 1½" = 1'–0"

NOTES:

1. SEE NOTES ON SHEET S–9A FOR MATERIALS OF MICROPILES.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

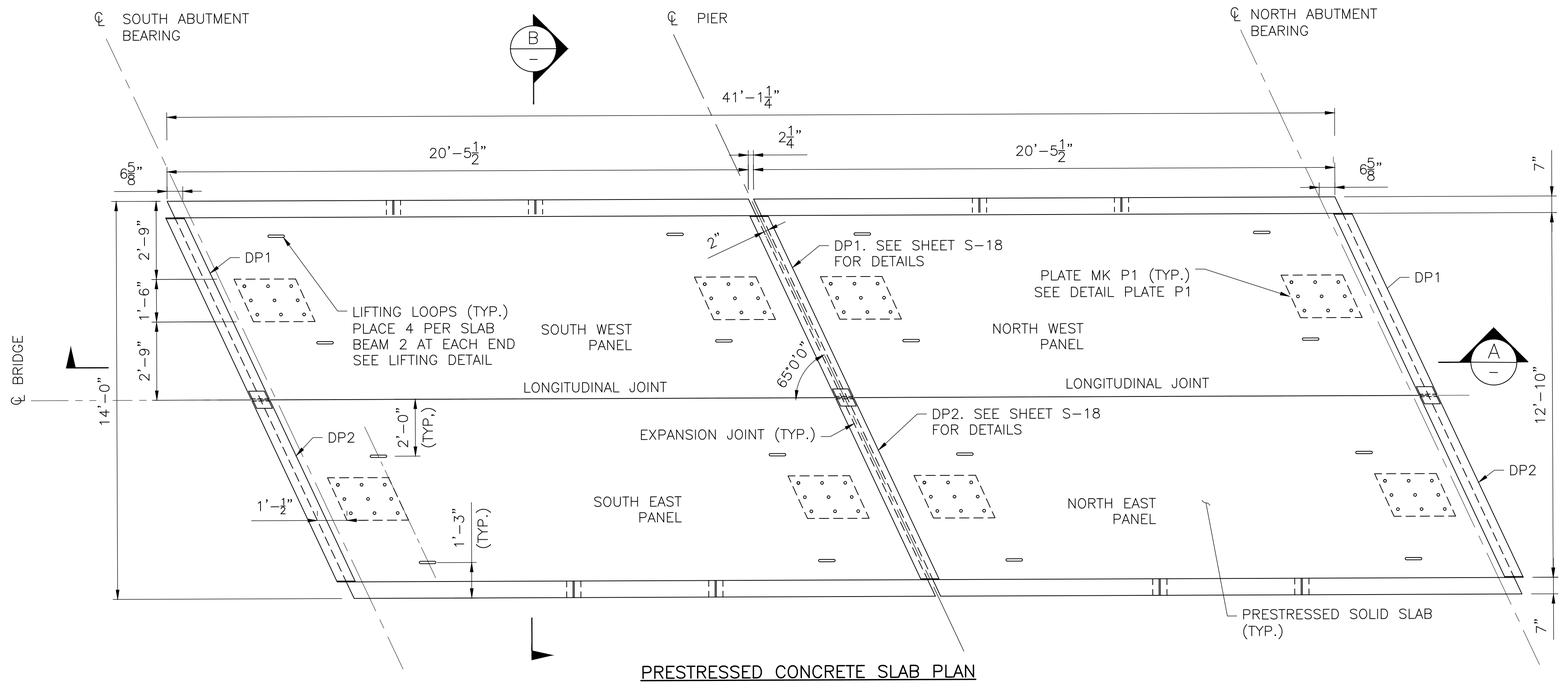
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
MICROPILE OPTION FOR WINGALLS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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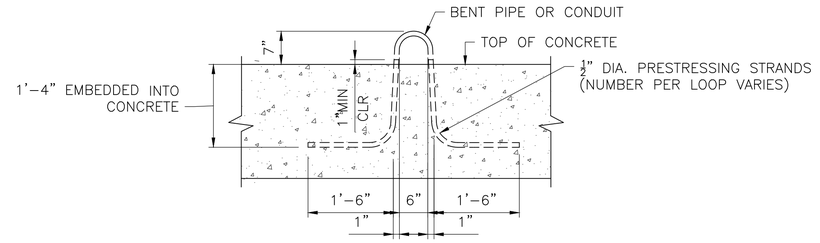
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SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	SSL	SSL	JQW	SHEET: S–14A	



PRESTRESSED CONCRETE SLAB PLAN

SCALE: ⅜" = 1'–0"



LIFTING DETAIL

SCALE: N.T.S.

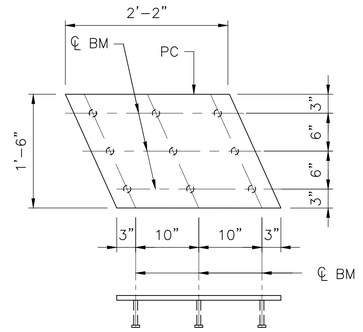
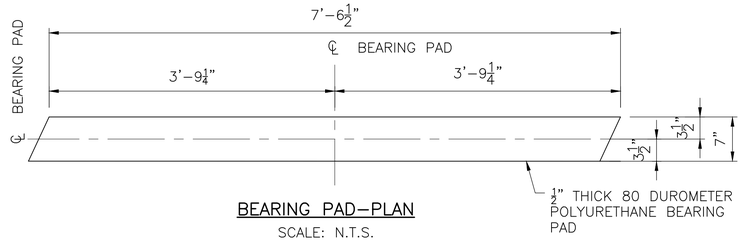


PLATE P1

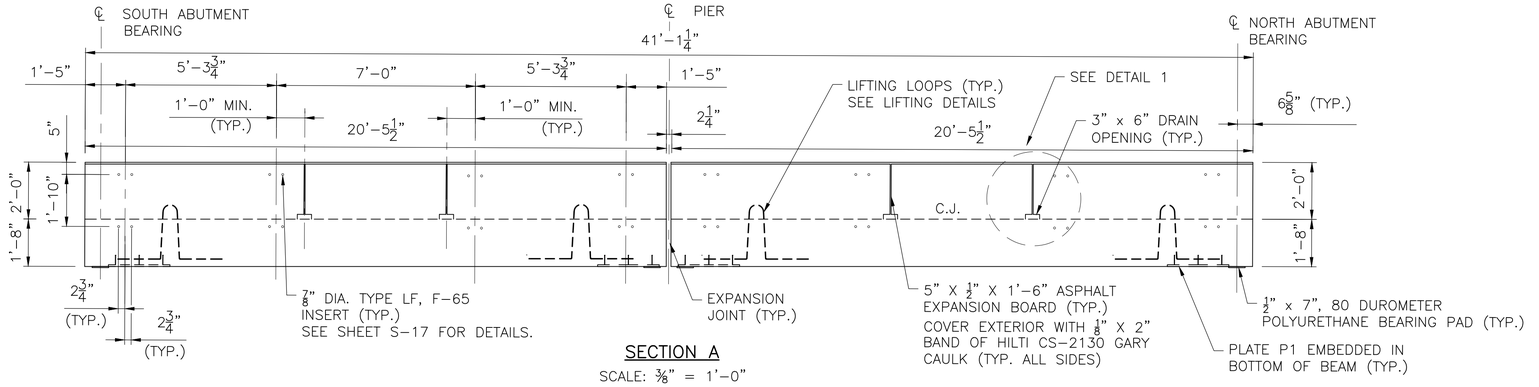
SCALE: N.T.S.

1 – PLATE ¾"X18"X2'–2"–PC
9–7/8" DIA X 4" SHEAR STUD– BM



BEARING PAD–PLAN

SCALE: N.T.S.



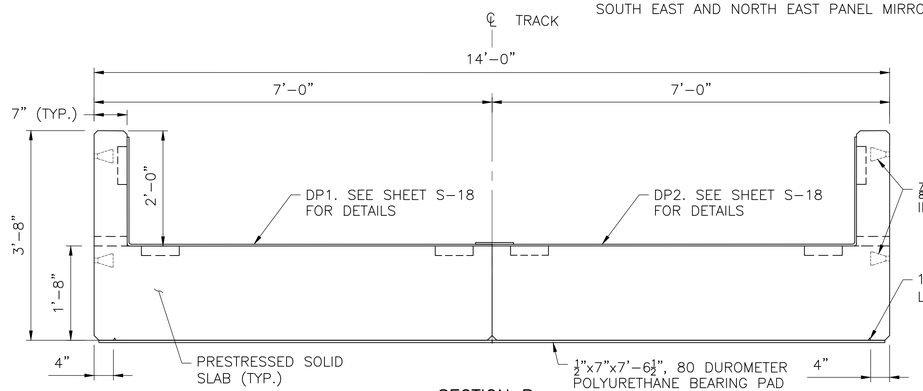
SECTION A

SCALE: ⅜" = 1'–0"

(SOUTH WEST AND NORTH WEST PANEL SHOWN, SOUTH EAST AND NORTH EAST PANEL MIRRORED.)

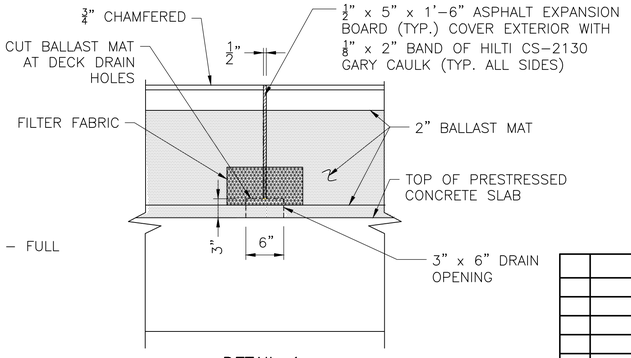
NOTE:

1. THE BEARING PAD SHALL BE IN ACCORDANCE WITH THE LATEST AREMA MANUAL WITH THE FOLLOWING CHARACTERISTICS/CONSTRAINTS:
   - 80 DUROMETER POLYURETHANE WITH A MINIMUM SHEAR MODULUS OF 500 PSI AND MAXIMUM SHEAR MODULUS OF 1,450 PSI.
   - AVERAGE COMPRESSIVE STRESS OF 1,000 PSI.



SECTION B

SCALE: ¾" = 1'–0"



DETAIL 1

SCALE: 1" = 1'–0"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

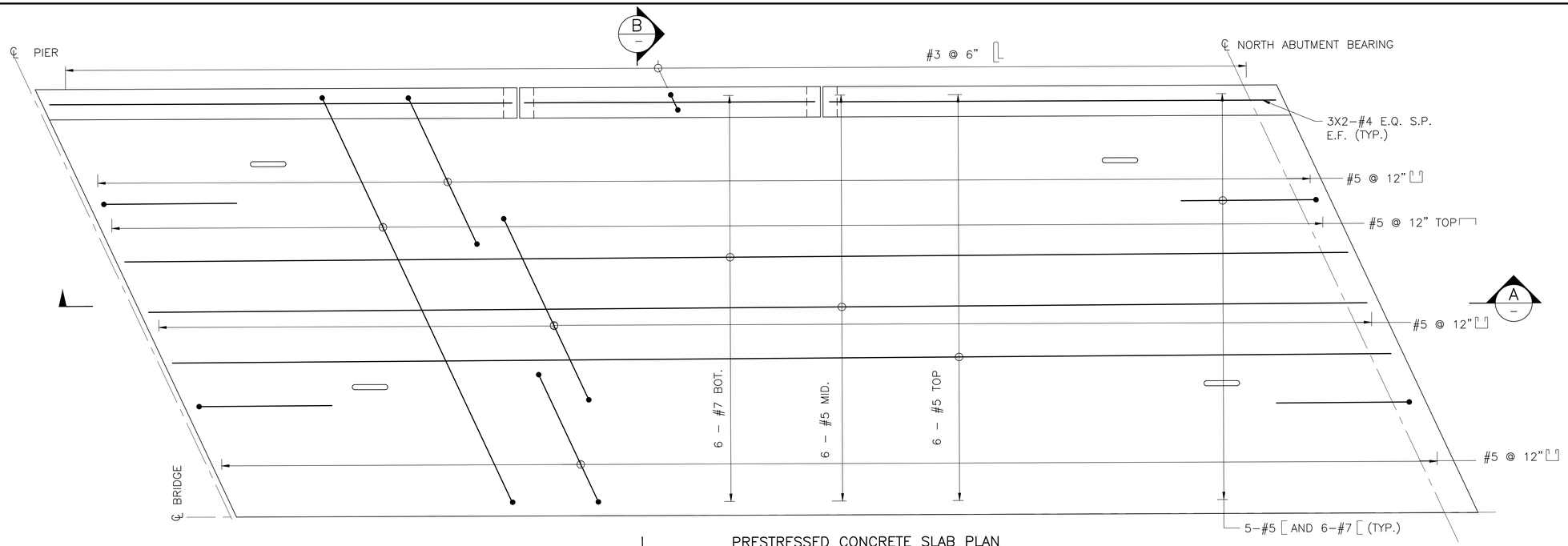
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PRESTRESSED CONCRETE SLAB
LAYOUT DETAILS

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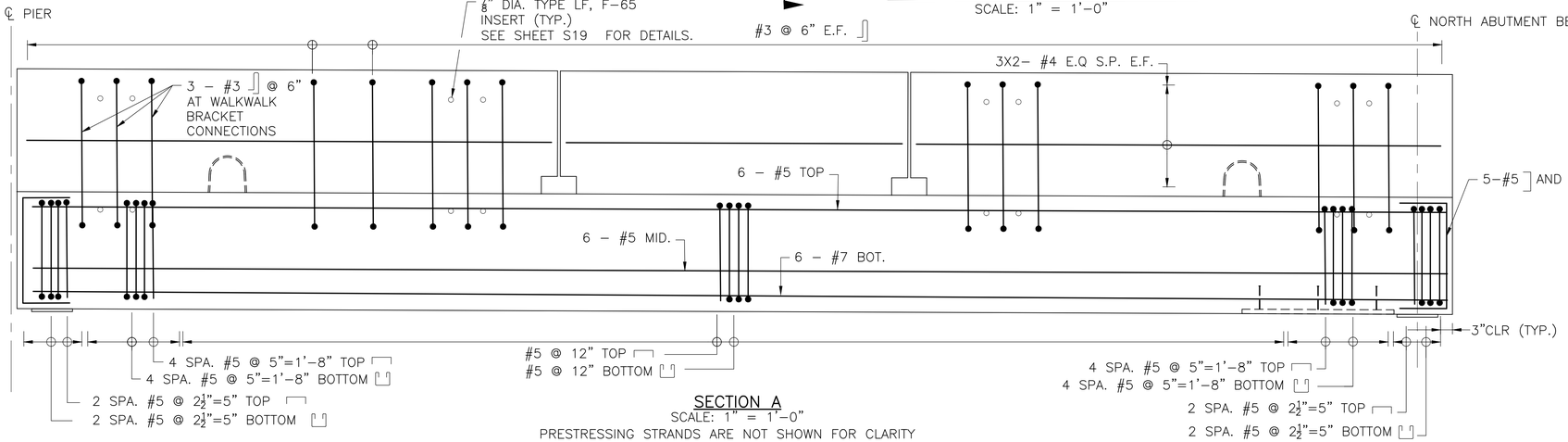
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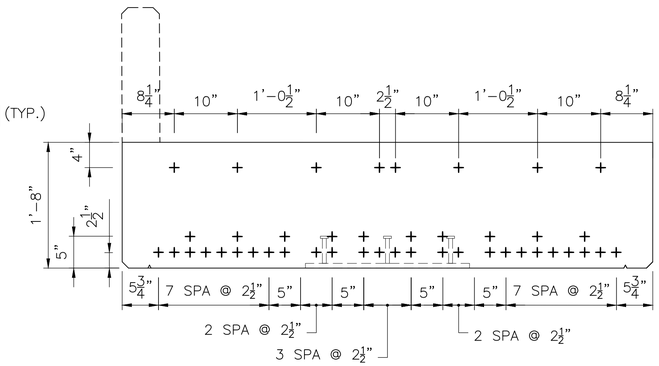
PRESTRESSED CONCRETE SLAB PLAN
SCALE: 1" = 1'–0"

LEGEND:

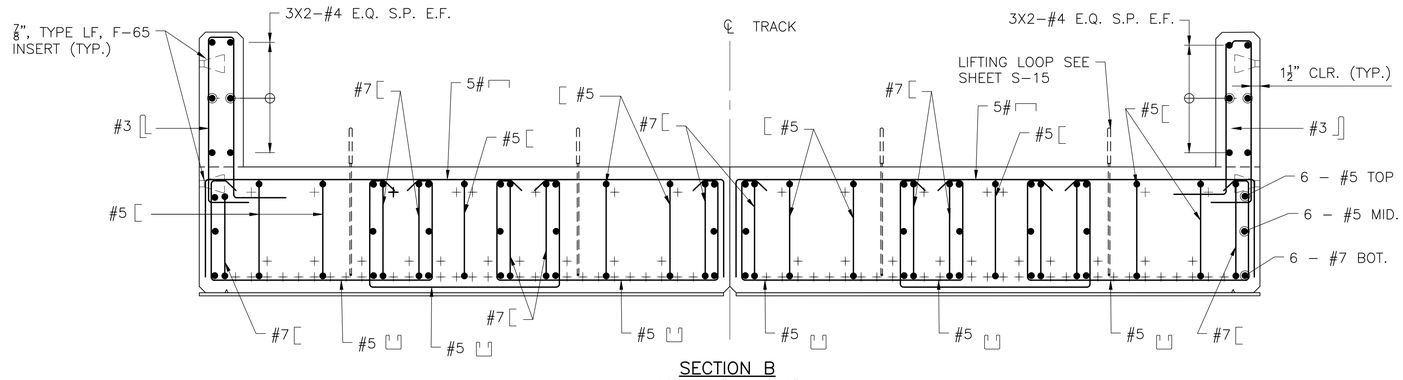
F.F.	DENOTES	FRONT FACE
B.F.	DENOTES	BACK FACE
E.F.	DENOTES	EACH FACE
MID.	DENOTES	MIDDLE LAYER
TYP.	DENOTES	TYPICAL
BOT.	DENOTES	BOTTOM
EQ.SP.	DENOTES	EQUALLY SPACED



SECTION A
SCALE: 1" = 1'–0"
PRESTRESSING STRANDS ARE NOT SHOWN FOR CLARITY



SECTION B
(ALL STRAIGHT TENDON)
SCALE: 1" = 1'–0"



SECTION B
SCALE: 1" = 1'–0"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

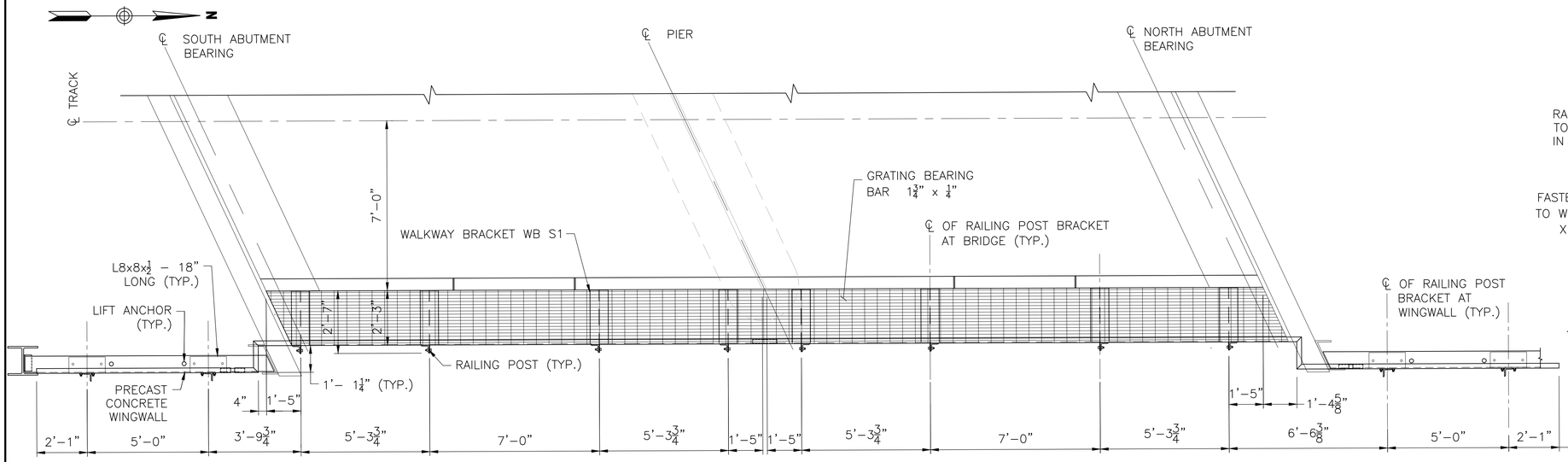
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
PRESTRESSED CONCRETE SLAB
REINFORCEMENT DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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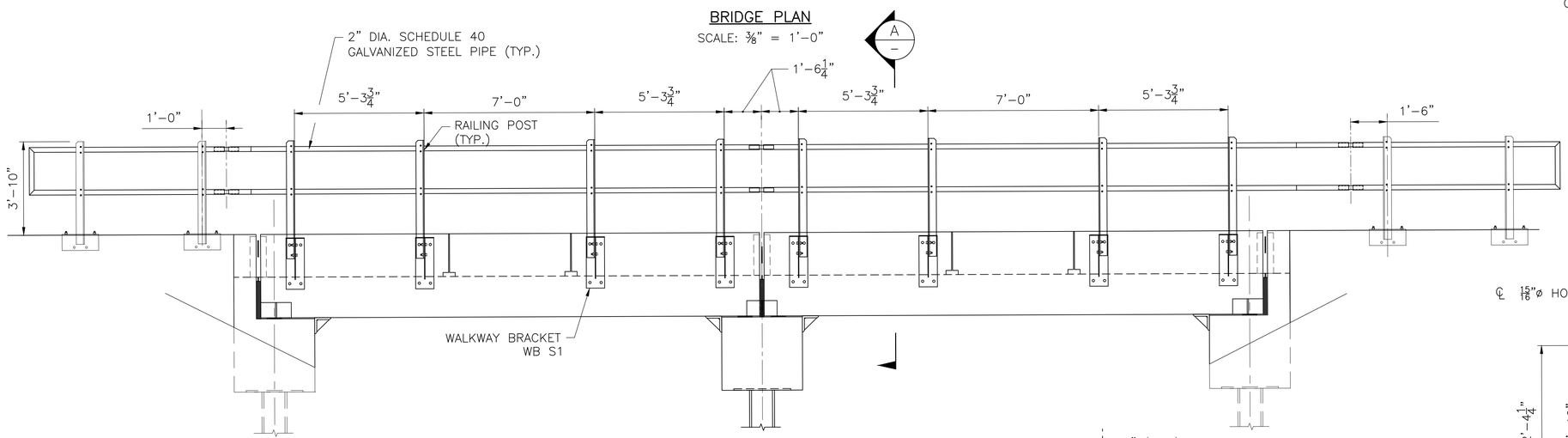
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SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	M.V.	E.Y.	SSL	SHEET: S–16	



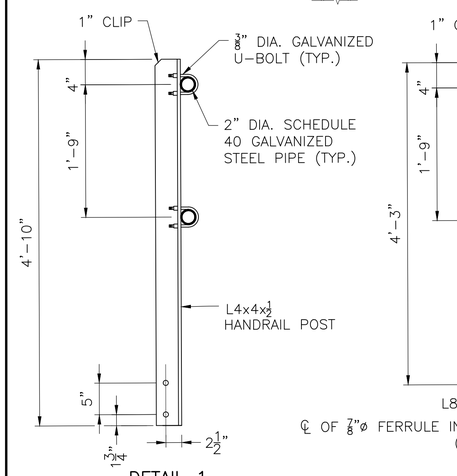
BRIDGE PLAN

SCALE: ⅜" = 1'-0"



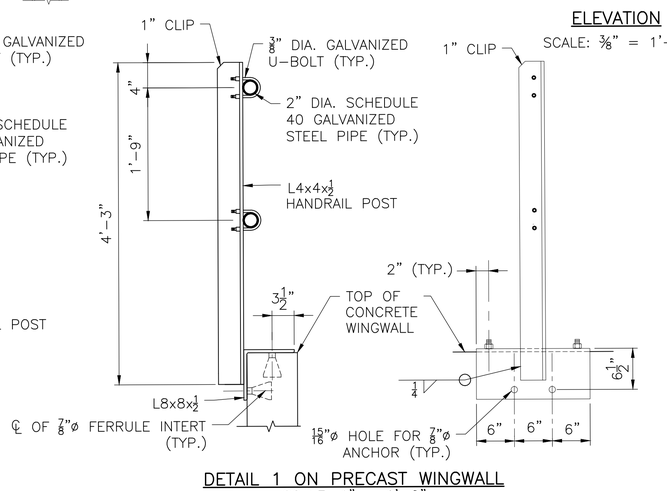
ELEVATION

SCALE: ⅜" = 1'-0"



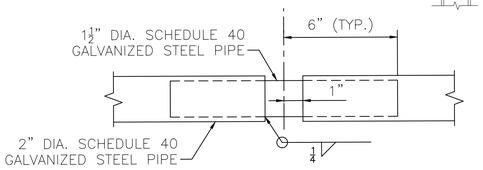
DETAIL 1

SCALE: 1" = 1'-0"



DETAIL 1 ON PRECAST WINGWALL

SCALE: 1" = 1'-0"



RAILING SPLICE DETAIL AT PIER & WINGWALLS

SCALE: 3" = 1'-0"

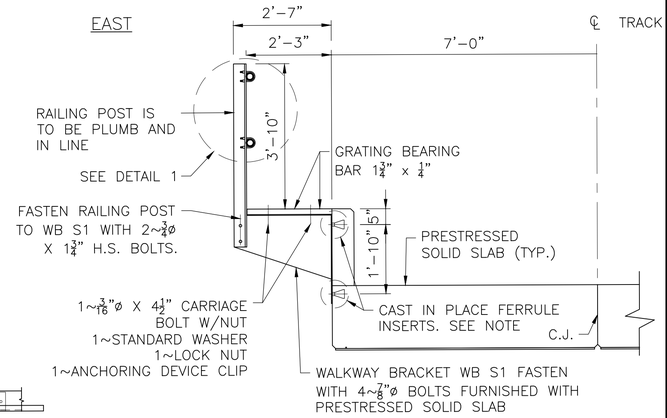
GENERAL NOTES:

1. MATERIAL: STRUCTURAL STEEL PLATES AND BARS SHALL MEET THE REQUIREMENTS OF ASTM A709, GRADE 36.
2. ALL BOLTS SHALL MEET THE REQUIREMENT OF ASTM F3125, GRADE A325.

FABRICATION NOTES:

1. SHOP NOTES: FABRICATION AND ARC WELDING OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH CHAPTER 15, PART 3 OF THE CURRENT A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING.
2. GALVANIZING: WB S1 WALKWAY BRACKET, HANDRAIL POSTS AND HAND RAIL SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE CURRENT A.S.T.M. DESIGNATION: A123.
3. AFTER GALVANIZING ALL ELEMENTS SHALL BE FREE OF FINS, ABRASIONS, ROUGH OR SHARP EDGES AND OTHER SURFACE DEFECTS.

EAST

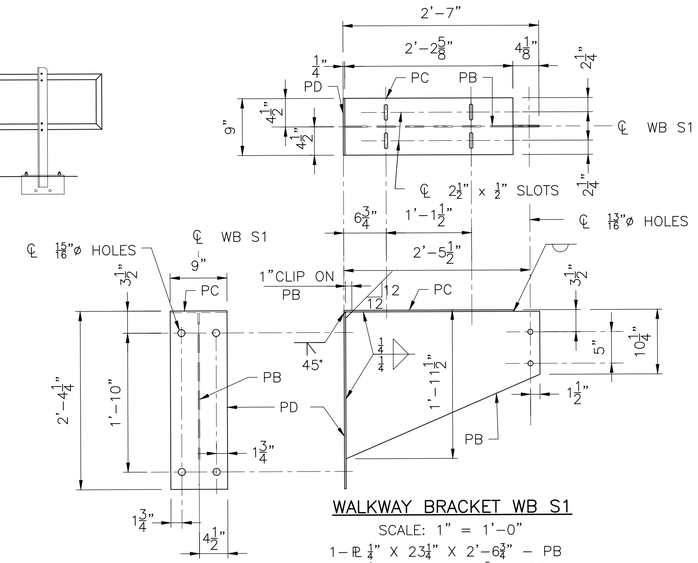


SECTION A

SCALE: ½" = 1'-0"

NOTE:

CAST IN PLACE FERRULE INSERTS TYPE LF X ⅞"ø AS MANUFACTURED BY DAYTON/RICHMOND SCREW ANCHOR CO. OR EQUAL. MINIMUM SHEAR = 3,000 LBS. MINIMUM TENSION = 3,660 LBS. 4 INSERTS PER WALKWAY BRACKET LOCATION. FURNISH WITH ⅞"ø BOLTS AND WASHERS. ALL ITEMS SHALL BE GALVANIZED.



WALKWAY BRACKET WB S1

SCALE: 1" = 1'-0"

1 – PL ¼" X 23¼" X 2'-6¾" – PB
1 – PL ¼" X 9" X 2'-2⅝" – PC
1 – PL ¼" X 9" X 2'-4¼" – PD

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

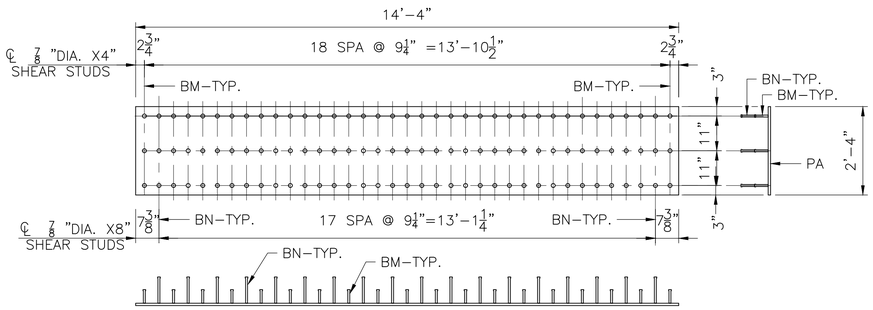
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
WALKWAY LAYOUT & DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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PILE PLATE PP1

SCALE: ½" = 1'–0"

1~PL ¾"X28"X14'–4"–PA

57~ ⅞" DIA X 4" SHEAR STUDS–BM

54~ ⅞" DIA X 8" SHEAR STUDS–BN

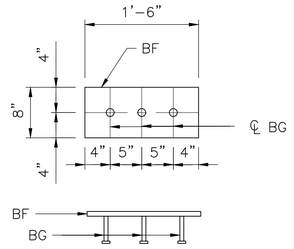


PLATE EP1

SCALE: N.T.S.

1~BAR 8"X¾"X1'–6"–BF

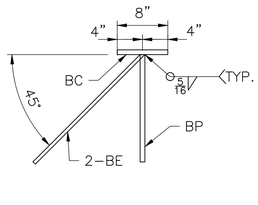
3~ ⅞" DIA X 4" STUDS–BG

GENERAL NOTES:

1. MATERIAL: STRUCTURAL STEEL PLATES AND BARS SHALL MEET THE REQUIREMENTS OF THE CURRENT A.S.T.M. DESIGNATION: A709. GRADE 36.
2. ALL STEEL PILE PLATES (PP1) SHALL MEET THE REQUIREMENTS OF THE CURRENT A.S.T.M. DESIGNATION: A709. GRADE 50.
3. SHEAR CONNECTOR STUDS SHALL MEET THE REQUIREMENTS OF SECTION 7 OF THE CURRENT A.W.S. STRUCTURAL WELDING CODE D1.1 FOR GRADE 1020 SOLID FLUX FILLED HEADED STUDS.

FABRICATION NOTES:

1. SHOP NOTES: FABRICATION AND ARC WELDING OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH CHAPTER 15, PART 3 OF THE CURRENT A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING.
   - OPEN HOLES: AS NOTED.
   - SHOP PAINT: NONE.
2. SHEAR CONNECTOR STUDS SHALL BE AUTOMATICALLY END WELDED WITH COMPLETE FUSION IN ACCORDANCE WITH SECTION 7 OF THE CURRENT A.W.S. STRUCTURAL WELDING CODE D1.1.
3. DECK PLATE DP1 AND DP2 SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE CURRENT A.S.T.M. DESIGNATION: A123
4. AFTER GALVANIZING ALL ELEMENTS SHALL BE FREE OF FINS, ABRASIONS, ROUGH OR SHARP EDGES AND OTHER SURFACE DEFECTS.



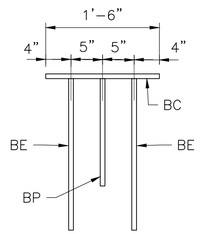


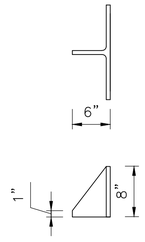
PLATE EP2

SCALE: N.T.S.

1~BAR 8"X¾"X1'–6"–BC

2~BARS #6 X 2'–0" –BE

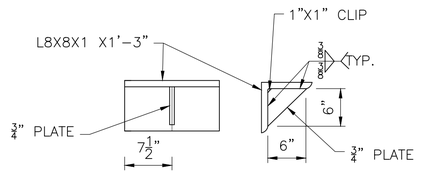
1~BARS #6 X 1'–5" –BP



BRACKET BK1

SCALE: N.T.S.

CONTRCTOR TO FIELD FABRICATE FROM HP14X117 GALVANIZED AFTER FABRICATION

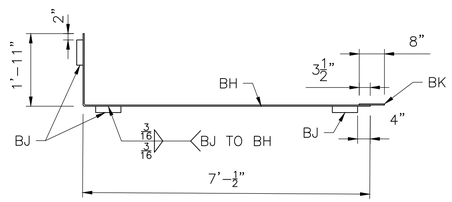


LONGITUDINAL RESTRAINT BRACKET MK LRB1

SCALE: N.T.S.

1~ L8X8X1 X1'–3"

1~PL ¾ "X6" X0'–6"



DECK PLATE DP1

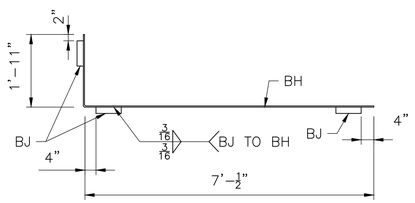
SCALE: ½" = 1'–0"

1~PL ⅜"x8"x8'–11½" (BENT)–BH

3~BARS 2"x ⅜"x0'–8"–BJ

1~BAR 7'–¾"x⅜"x0'–8"–BK

GALVANIZED AFTER FABRICATION



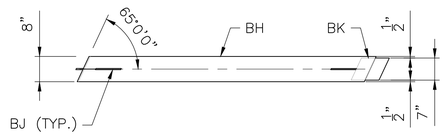
DECK PLATE DP2

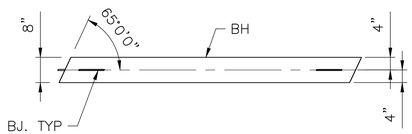
SCALE: ½" = 1'–0"

1~PL ⅜"x8"x8'–11½" (BENT)–BH

3~BARS 2"x⅜"x0'–8"–BJ

GALVANIZED AFTER FABRICATION





MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

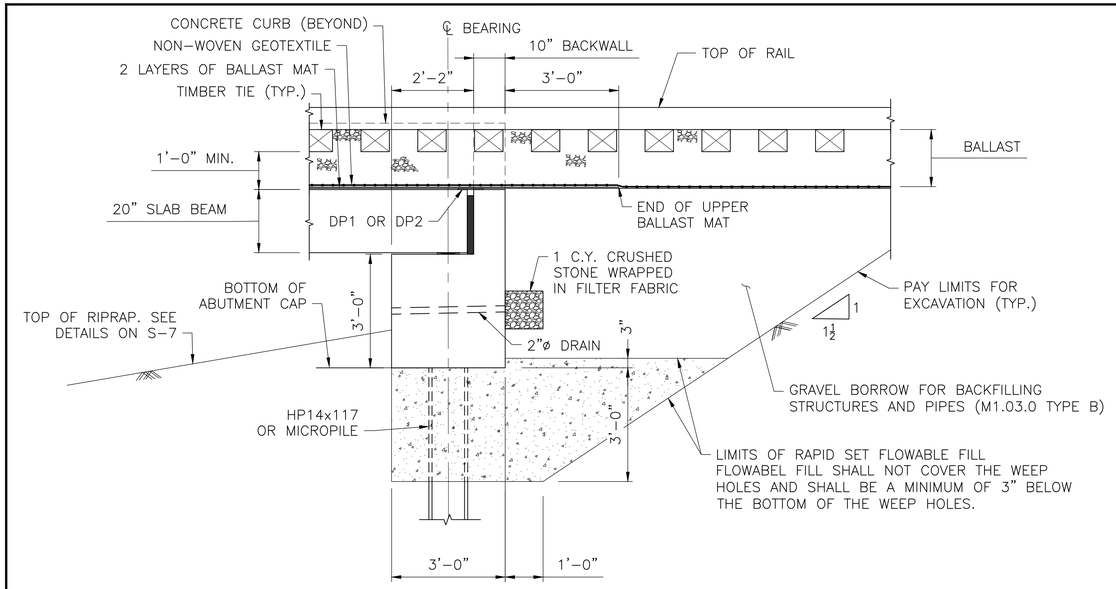
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
STEEL DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

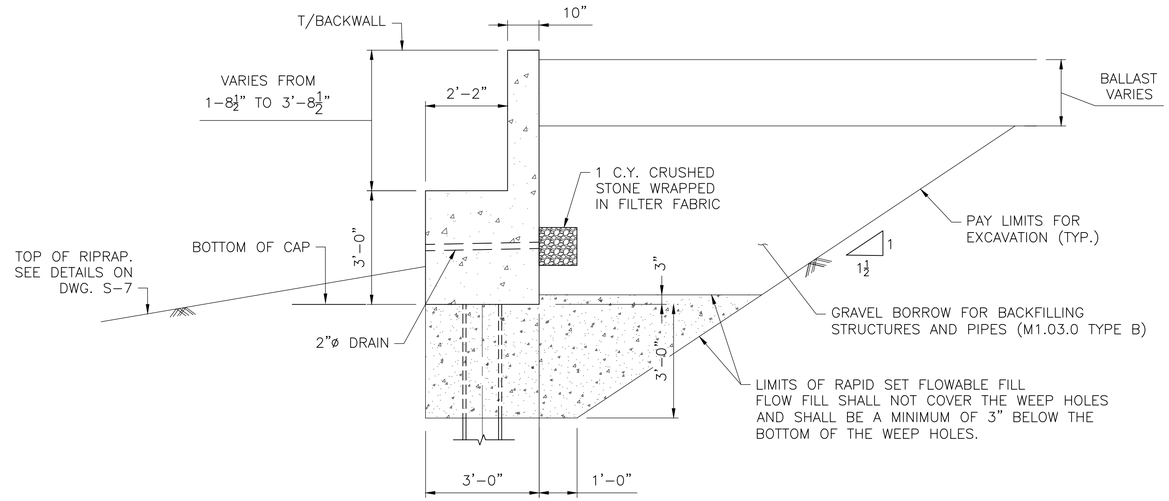
massDOT Massachusetts Department of Transportation Rail & Transit Division

SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	A.T.	E.Y.	G.J.	SHEET: S–18	



TYPICAL ABUTMENT SECTION AT TRACK

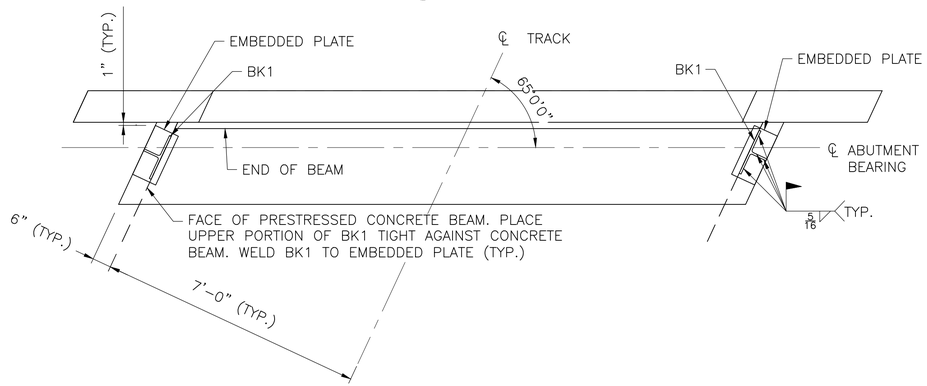
SCALE: ½" = 1'-0"



TYPICAL ABUTMENT SECTION OUTSIDE OF TRACK

SCALE: ½" = 1'-0"

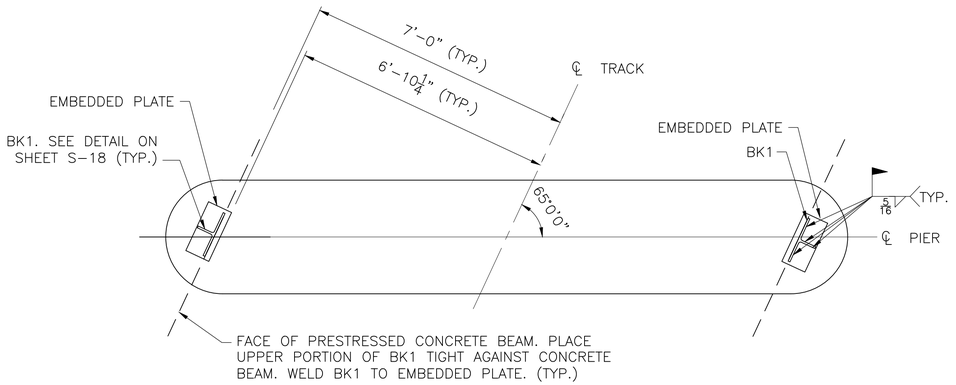
BEFORE BACKFILLING END BENTS, APPLY A COATING OF PETROLATUM TO PILE PLATE PP1, AND TOP ONE FOOT OF PILES (DIMENSION PERPENDICULAR TO DECK)



ABUTMENT – WELDING OF LATERAL RESTRAINT BK1

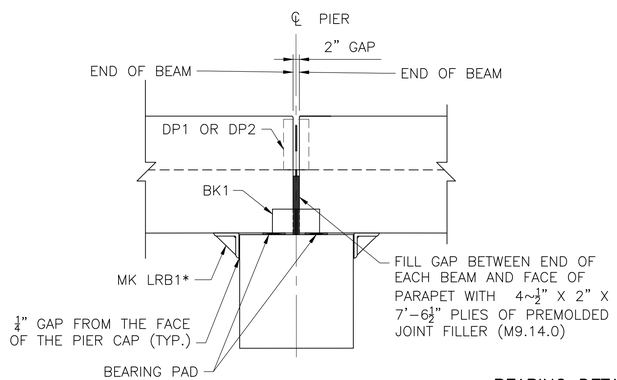
SCALE: ½" = 1'-0"

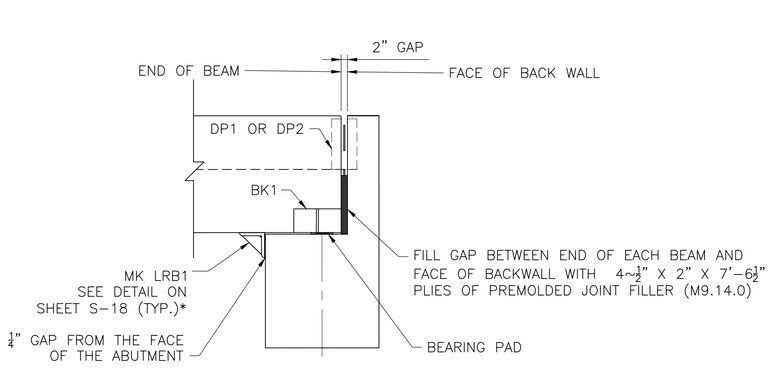
(SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR)



PIER CAP – WELDING OF LATERAL RESTRAINT BK1

SCALE: ½" = 1'-0"





BEARING DETAILS–SLAB GIRDERS

SCALE: ½" = 1'-0"

DIMENSION PERPENDICULAR TO DECK

* PLACE LONGITUDINAL RESTRAINT BRACKET MK LRB1 WITH ¼" GAP BETWEEN ABUTMENT BENT CAPS/CENTER BENT CAP AND BRACKET AND 5/16" FIELD FILLET WELD TO PLATE IN BOTTOM OF BEAM.

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 77.04 - CODDING BROOK BRIDGE
MISCELLANEOUS DETAILS

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 307-7700

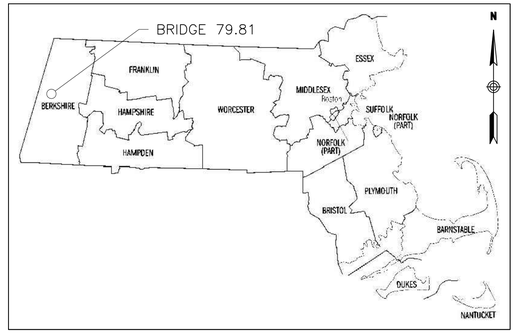
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MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
RAIL & TRANSIT DIVISION

REPLACEMENT OF BERKSHIRE LINE BRIDGE NO.79.81

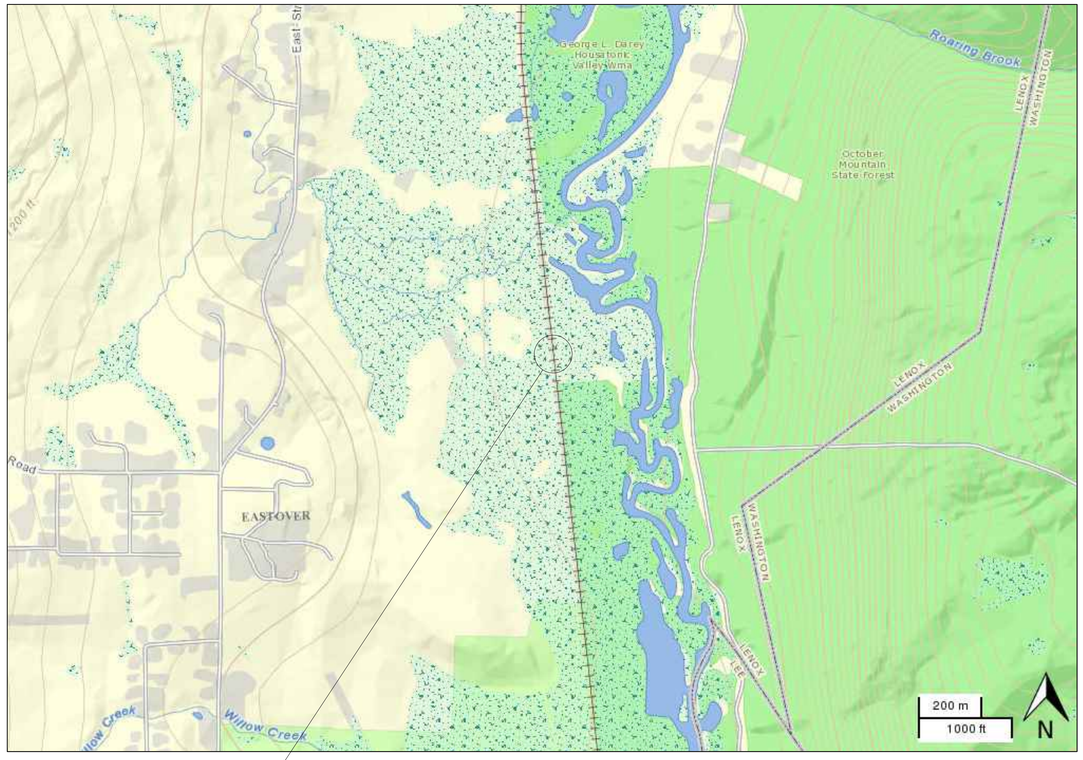
PROJECT LOCATION: LENOX, MA



LOCATION MAP

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
G-1	TITLE SHEET & INDEX
TK-01	MAINLINE TRACK PLAN AND PROFILE STA. 6+40 TO STA. 12+20
TK-02	MAINLINE TRACK PLAN AND PROFILE STA. 12+20 TO STA. 13+40
XS-01	PROPOSED CROSS SECTIONS STA. 6+80 TO STA. 7+80
XS-02	PROPOSED CROSS SECTIONS STA. 8+00 TO STA. 9+00
XS-03	PROPOSED CROSS SECTIONS STA. 9+20 TO STA. 10+20
XS-04	PROPOSED CROSS SECTIONS STA. 10+40 TO STA. 11+40
XS-05	PROPOSED CROSS SECTIONS STA. 11+60 TO STA. 12+60
XS-06	PROPOSED CROSS SECTIONS STA. 12+80 TO STA. 13+00
S-1	STRUCTURAL GENERAL NOTES
S-2	KEY PLAN AND PROFILE
S-3	BORING SHEET 1 OF 2
S-4	BORING SHEET 2 OF 2
S-5	DEMOLITION LIMITS - PLAN AND ELEVATION
S-6	PROPOSED BRIDGE PLAN & ELEVATION
S-7	CONSTRUCTION STAGING
S-8	FOUNDATION LAYOUT DETAILS
S-8A	DETAILS FOR MICROPILE OPTION
S-9	ABUTMENT LAYOUT DETAILS
S-10	PIER LAYOUT DETAILS
S-11	ABUTMENT CAP REINFORCEMENT DETAILS
S-12	PIER CAP REINFORCEMENT DETAILS
S-13	PRESTRESSED CONCRETE SLAB LAYOUT DETAILS
S-14	PRESTRESSED CONCRETE SLAB REINFORCEMENT DETAILS
S-15	WALKWAY LAYOUT & DETAILS
S-16	STEEL DETAILS
S-17	MISCELLANEOUS DETAILS
S-18	PRECAST APPROACH SLAB DETAILS
S-19	STEEL SHEET PILE WALL DETAILS



PLAN

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

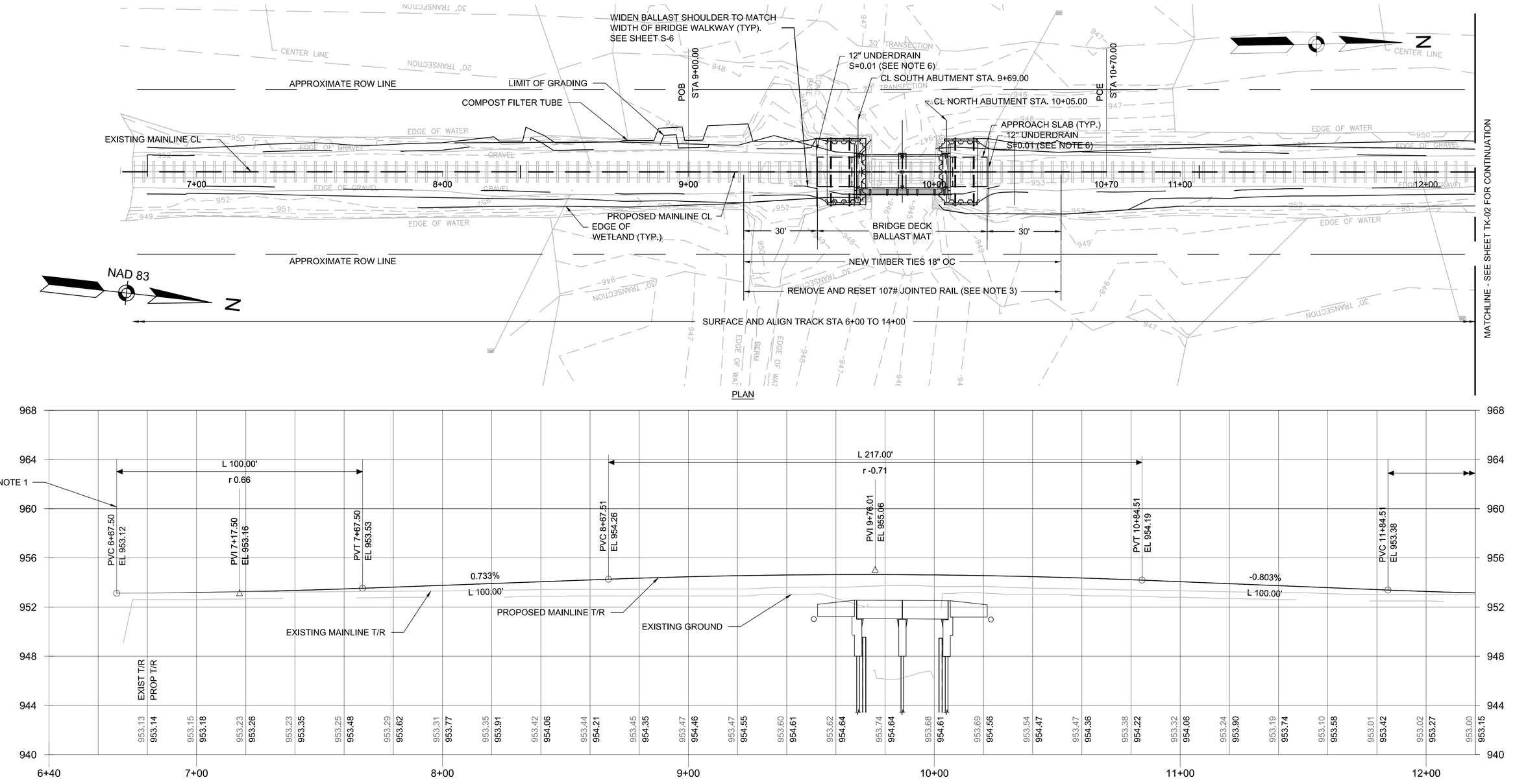
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
TITLE SHEET & INDEX

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PROFILE

MAINLINE GEOMETRY DATA

ELEMENT	POINT	STATION	BEARING	COORDINATES	
				NORTHING	EASTING
TANGENT	POB	9+00	N 05° 09'22.17" W	2961634.8137	184872.6651
	POE	10+70	N 05° 09'22.17" W	2961903.7211	184848.4000

NOTES:

1. SURFACE AND ALIGNMENT LIMIT EXTENDS BEYOND THE VERTICAL CURVE.
2. EXISTING TIES SHALL BE REMOVED WITHIN THE LIMITS SHOWN ON THE PLANS. TIES NOT IDENTIFIED FOR SALVAGE BY THE ENGINEER SHALL BE DISPOSED OF IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
3. EXISTING RAIL, PLATES, AND JOINT BARS TO BE REMOVED AND RESET. LIMIT OF RAIL REMOVAL SHALL BE AT THE FIRST RAIL JOINT LOCATED BEYOND THE TIE REPLACEMENT LIMIT.
4. BALLAST SHALL BE REMOVED TO A DEPTH OF 8" MIN BELOW THE PROPOSED BOTTOM OF TIE ELEVATION IN TIE REPLACEMENT AREAS EXCEPT AS NOTED OTHERWISE ON THE TRANSITION SLAB DETAILS.
5. EXISTING TRACK TO BE SURFACED AND ALIGNED TO MEET PROPOSED TRACK.
6. HIGHPOINT OF UNDERDRAIN AT CENTERLINE OF TRACK. SLOPE EACH SIDE DOWN TOWARDS TRACK EMBANKMENT.

HOR. SCALE IN FEET
20 0 20 40
VER. SCALE IN FEET
4 0 4 8

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

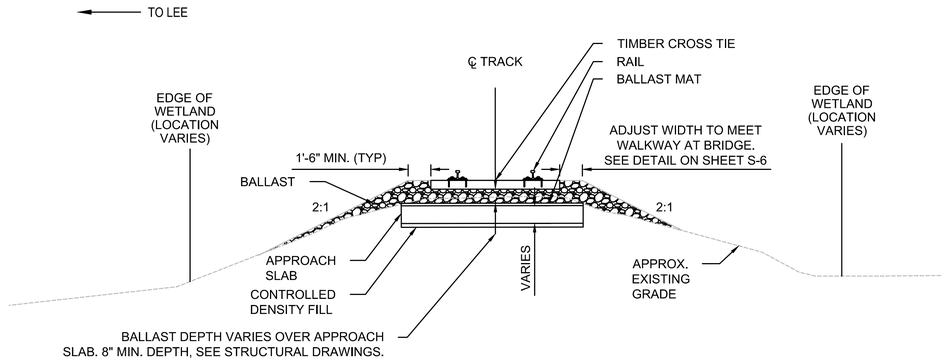
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
MAINLINE TRACK PLAN AND PROFILE
STA. 6+40 TO STA. 12+20

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BOSTON, MA 02110
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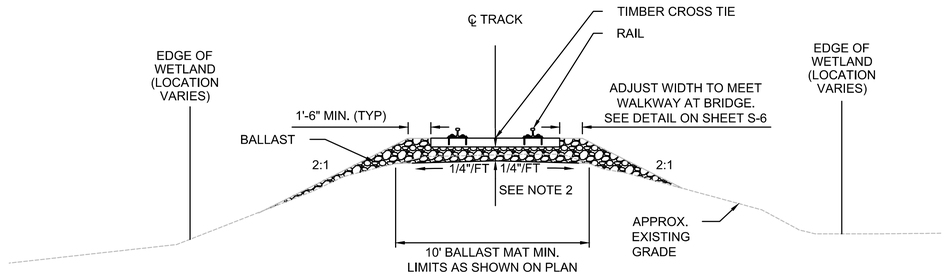
massDOT Massachusetts Department of Transportation Rail & Transit Division

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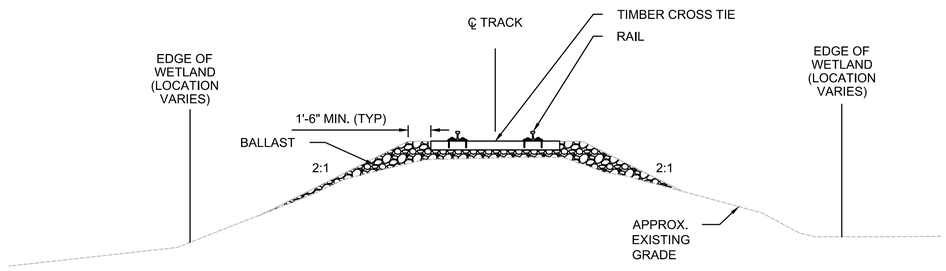
TYPICAL SECTION
STA. 9+52 TO STA. 9+67 AND STA. 10+06 TO STA. 10+21

NOT TO SCALE



TYPICAL SECTION
STA. 9+22 TO STA. 9+52 AND STA. 10+21 TO STA. 10+51

NOT TO SCALE

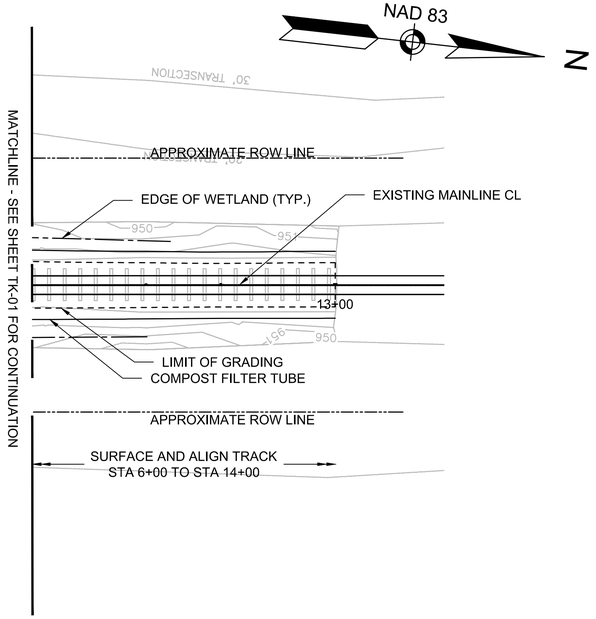


TYPICAL SECTION
STA. 6+00 TO STA. 9+22 AND STA. 10+50 TO STA. 14+00

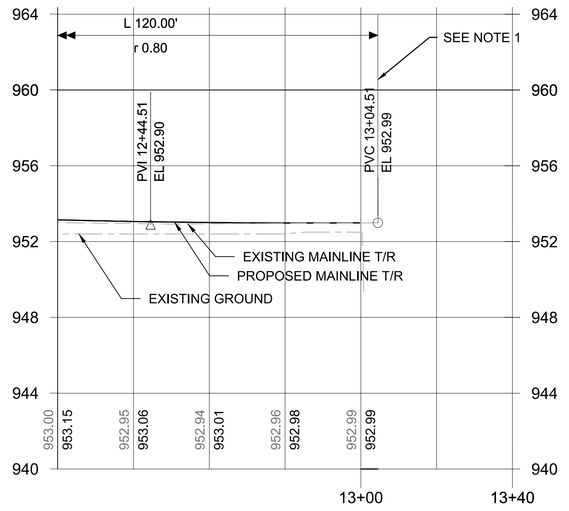
NOT TO SCALE

NOTES:

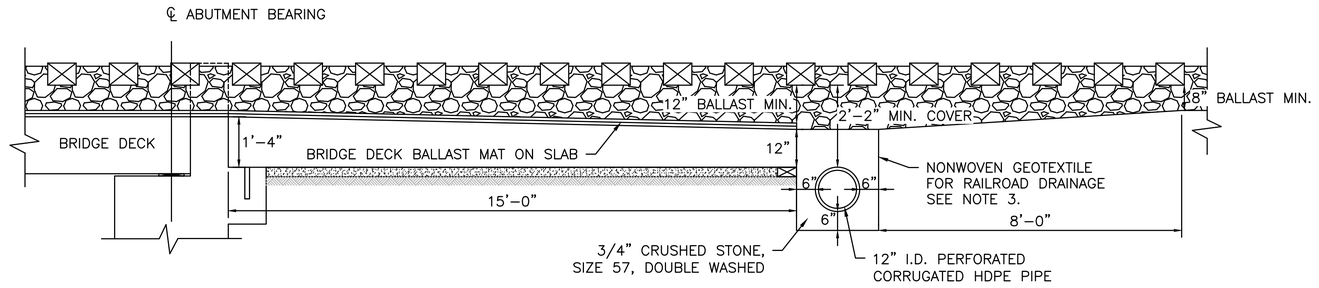
1. SURFACE AND ALIGNMENT LIMIT EXTENDS BEYOND THE VERTICAL CURVE.
2. BALLAST SHALL BE REMOVED TO A DEPTH OF 8" MIN. BELOW THE PROPOSED BOTTOM OF TIE ELEVATION IN THE TIE REPLACEMENT AREAS EXCEPT AS NOTED OTHERWISE ON THE TRANSITION SLAB DETAILS.
3. OVERLAP SUBSURFACE DRAINAGE GEOTEXTILE A MINIMUM OF 12" ON TOP OF THE UNDERDRAIN TRENCH AND A MINIMUM OF 12" AT ALL OTHER LOCATIONS WHERE THE DRAINAGE GEOTEXTILE OVERLAPS.



PLAN



PROFILE



TRANSITION SLAB DETAIL

NOT TO SCALE

HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

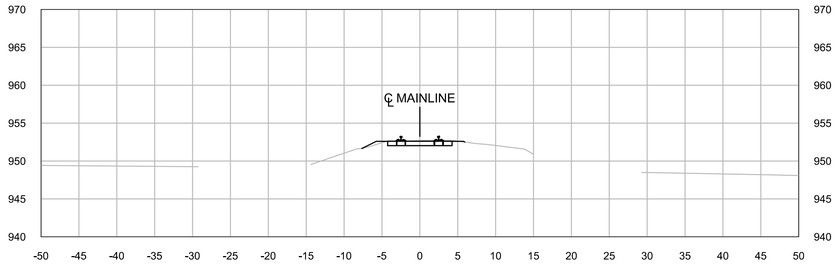
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
MAINLINE TRACK PLAN AND PROFILE
STA. 12+20 TO STA. 13+40

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

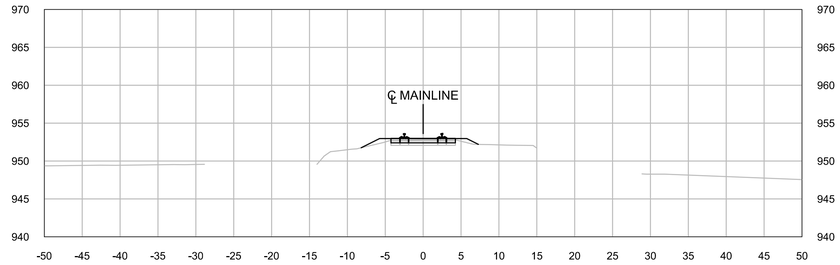
HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

massDOT Massachusetts Department of Transportation
Rail & Transit Division

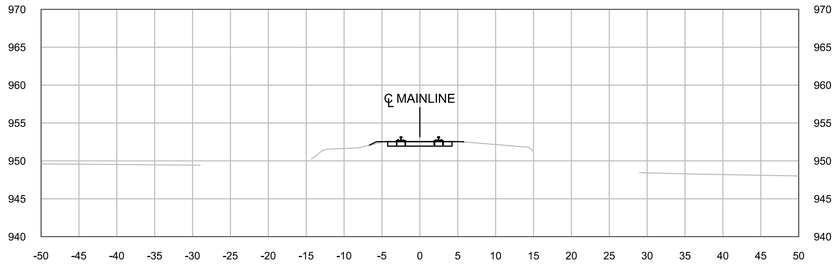
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DATE: 12/12/2022	CNL	CNL	SMM	SHEET: TK-02	



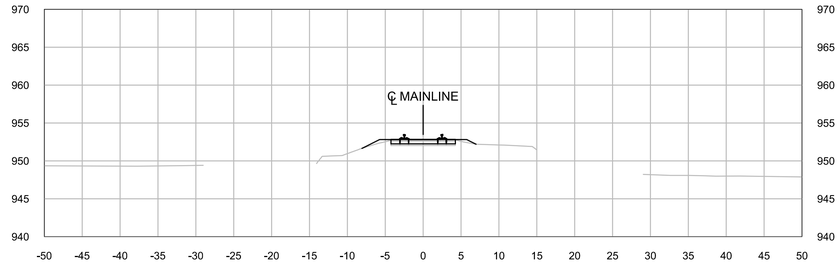
7+20



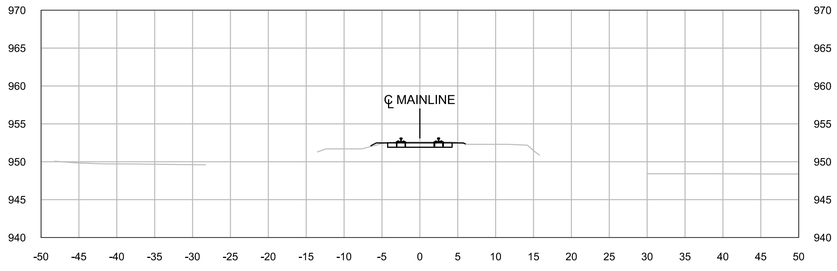
7+80



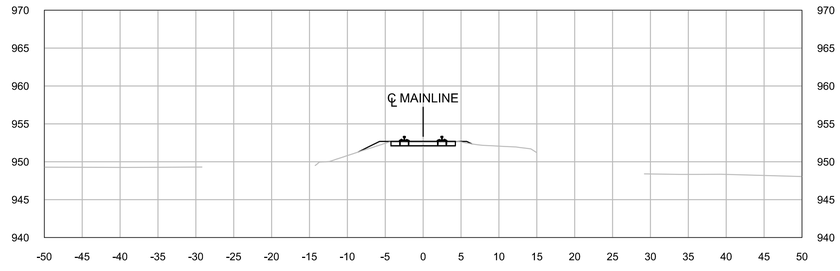
7+00



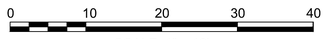
7+60



6+80



7+40



SCALE: 1" = 10'

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

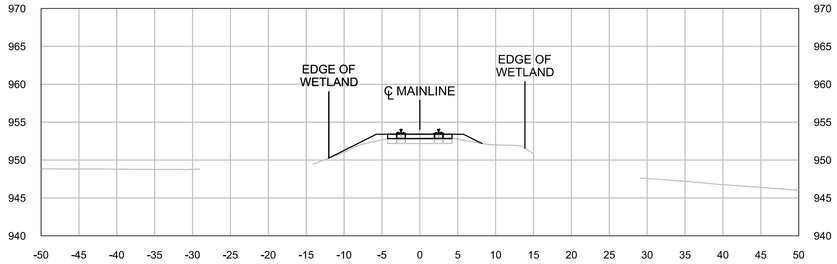
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PROPOSED CROSS SECTIONS
STA. 6+80 TO STA. 7+80

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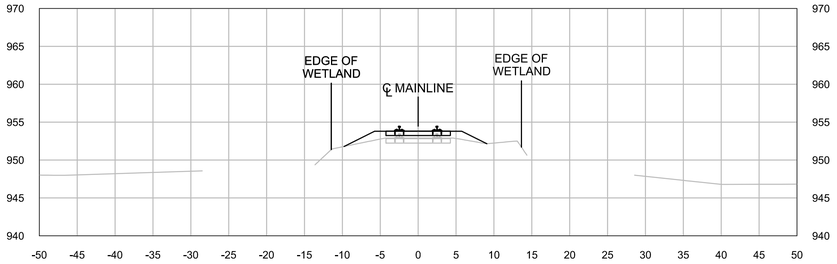
HDR, INC.
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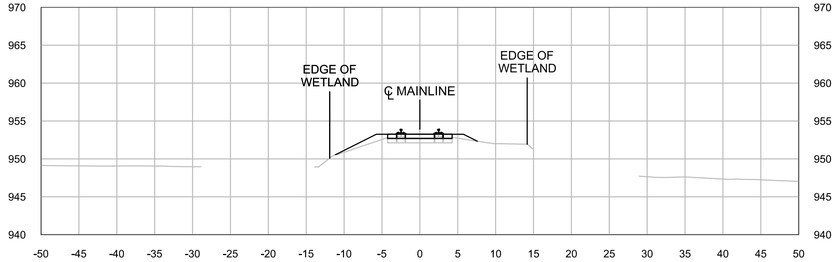
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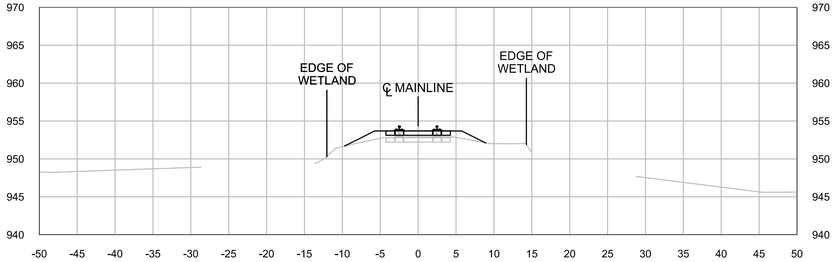
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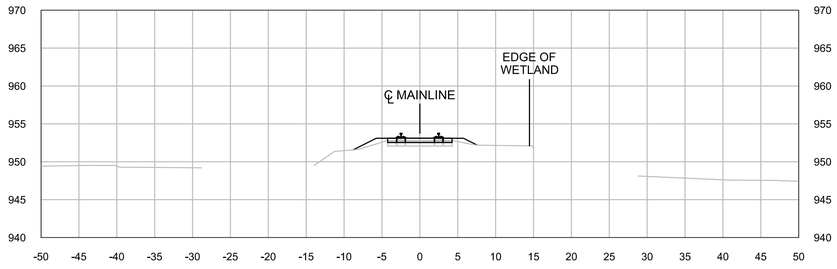
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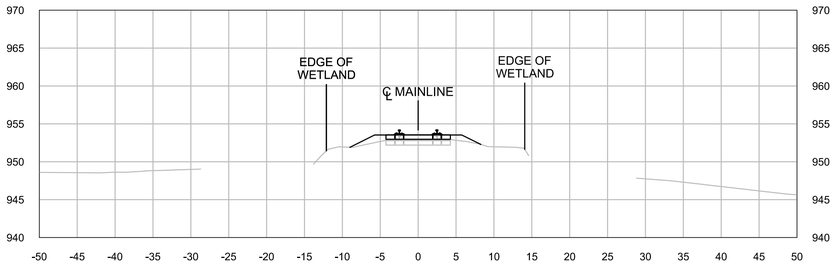
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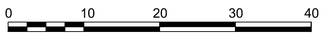
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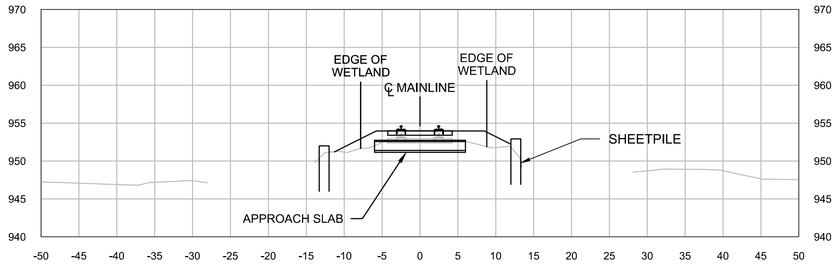
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PROPOSED CROSS SECTIONS
STA. 8+00 TO STA. 9+00

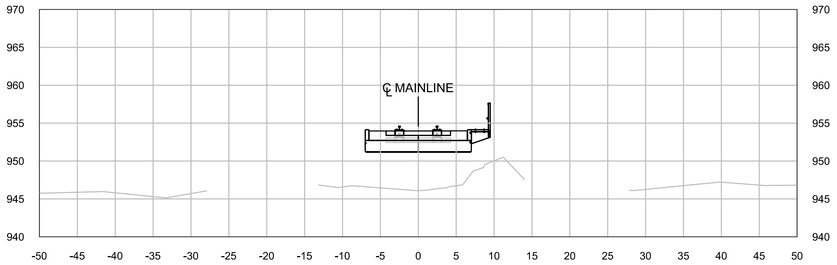
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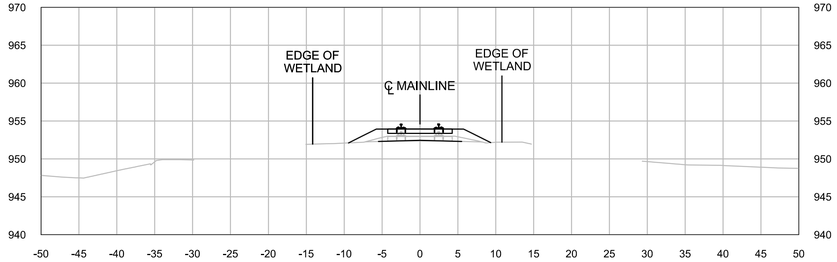
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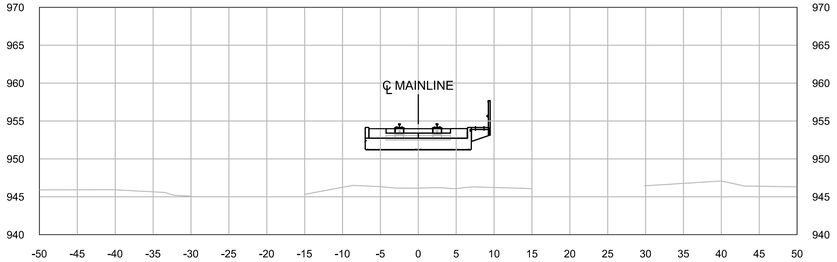
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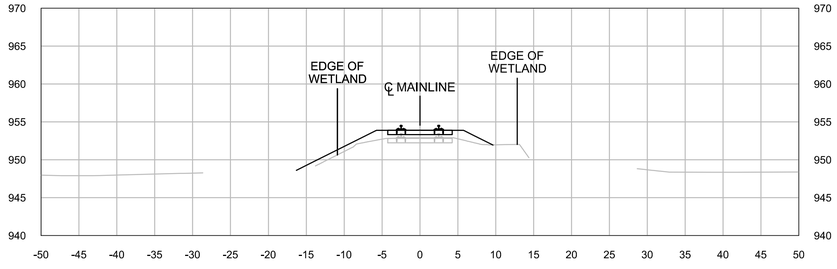
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9+40



9+80



9+20

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SCALE: 1" = 10'

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

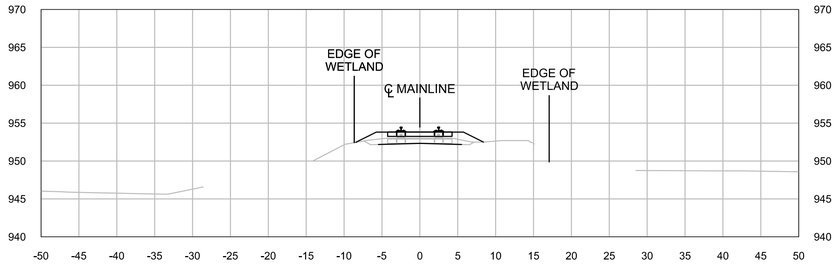
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PROPOSED CROSS SECTIONS
STA. 9+20 TO STA. 10+00

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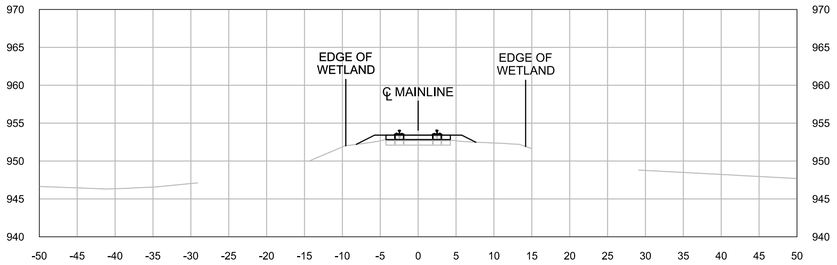
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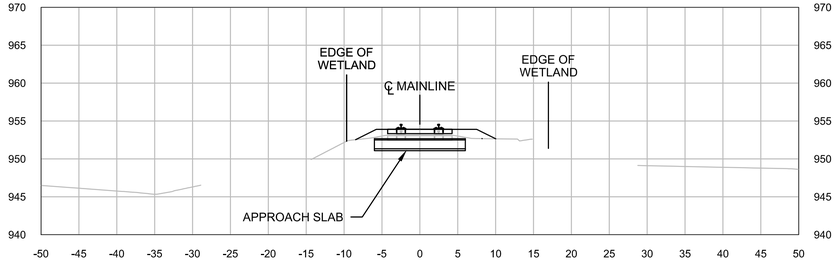
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10+40



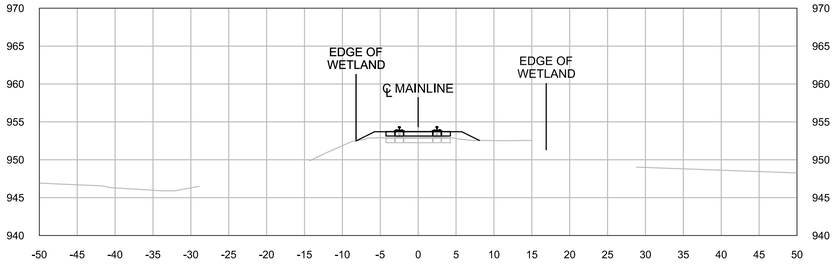
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10+20



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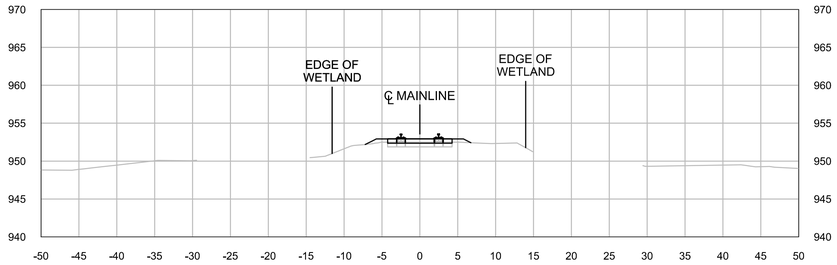
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PROPOSED CROSS SECTIONS
STA. 10+05 TO STA. 11+00

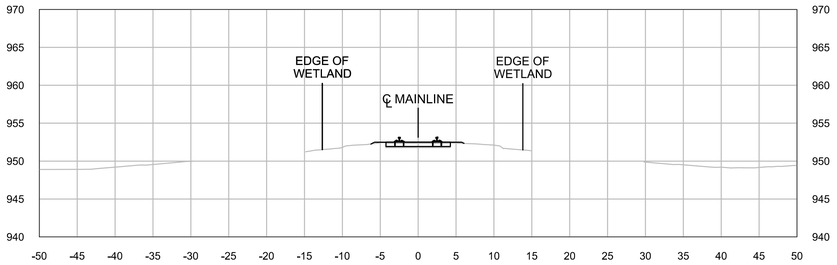
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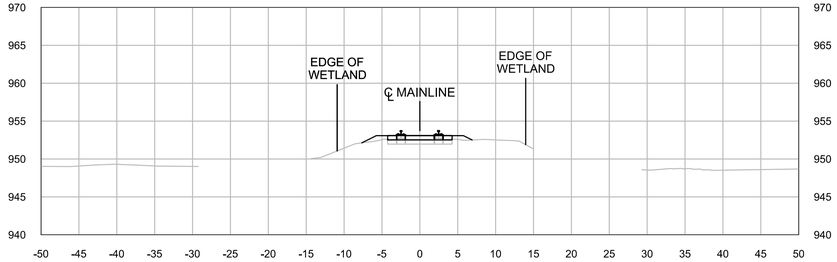
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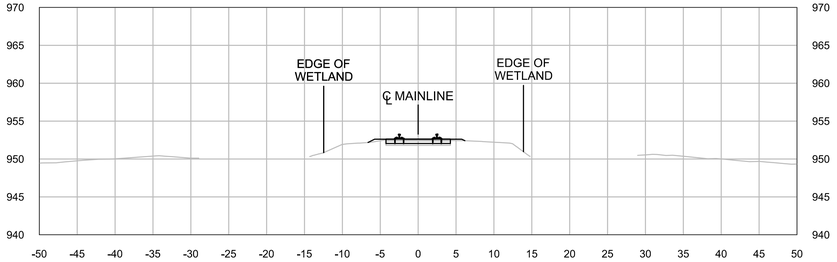
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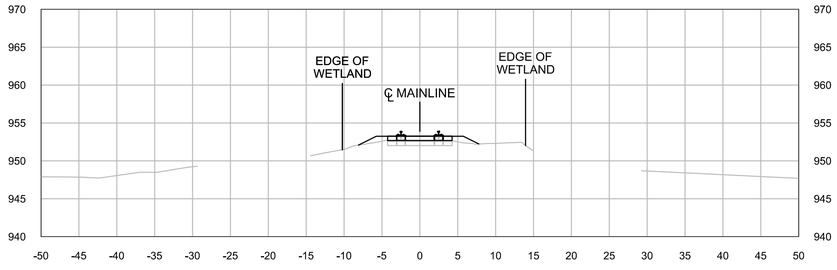
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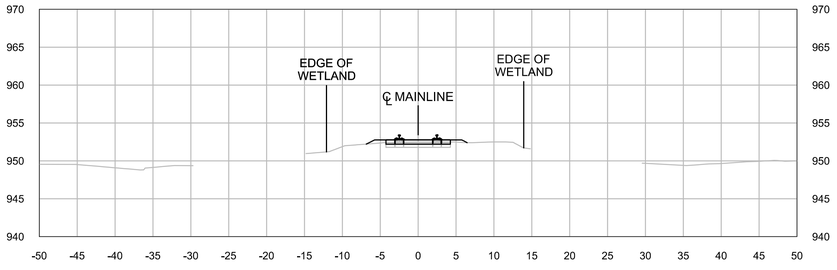
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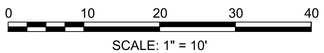
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11+20



11+80



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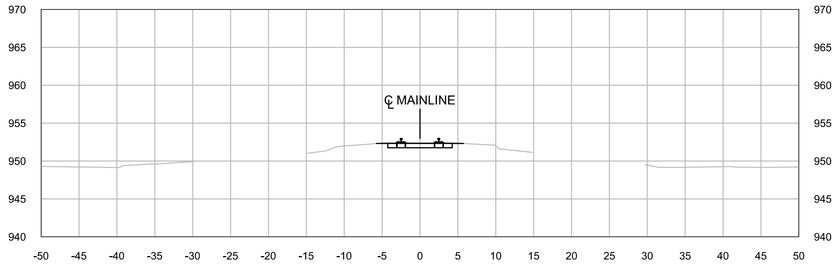
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PROPOSED CROSS SECTIONS
STA. 11+20 TO STA. 12+20

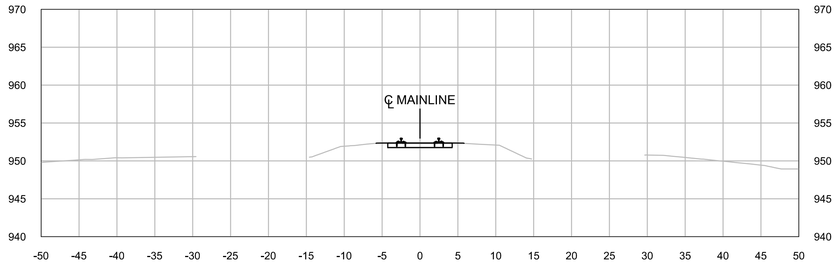
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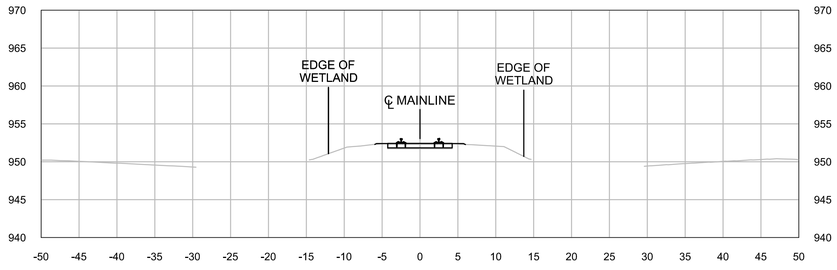
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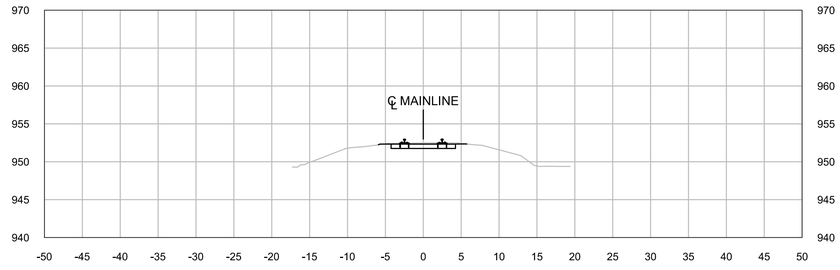
12+80



12+60



12+40



13+00

0 10 20 30 40

SCALE: 1" = 10'

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PROPOSED CROSS SECTIONS
STA. 12+40 TO STA. 13+00

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STRUCTURAL GENERAL NOTES

DESIGN, CONTRUCTION AND FABRICATION

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2022 MASSDOT STANDARD SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS DATED JUNE 30, 2022, SPECIAL PROVISIONS PROVIDED IN THE CONTRACT DOCUMENTS, AND THE LATEST EDITION OF AMERICAN RAILWAY ENGINEERING AND MAINTENANCE–OF–WAY ASSOCIATION (AREMA) "MANUAL FOR RAILWAY ENGINEERING". IN THE EVENT OF DISCREPANCIES BETWEEN THE AREMA SPECIFICATIONS AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, THE MORE STRINGENT SPECIFICATION SHALL APPLY AS DETERMINED BY THE ENGINEER.

LIVE LOAD

THE DESIGN LIVE LOAD FOR THE BRIDGE IS AREMA COOPER E80 LOADING.

EXISTING CONDITIONS

ALL DIMENSIONS AND ELEVATIONS SHOWN ON EXISTING STRUCTURE ARE FROM LIMITED FIELD INVESTIGATION. ALL DIMENSIONS AND EXISTING DETAILS NECESSARY FOR THE COMPLETION OF WORK SHALL BE DETERMINED BY THE CONTRACTOR BY FIELD MEASUREMENT AND PRE–CONSTRUCTION SURVEY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE FIELD MEASUREMENTS AND PRE–CONSTRUCTION SURVEY, AND SHALL NOT ORDER ANY MATERIAL OR BEGIN FABRICATION OR CONSTRUCTION UNTIL THE FIELD MEASUREMENTS AND PRE–CONSTRUCTION SURVEY ARE COMPLETED AND THE EXTENT OF THE PROPOSED WORK IS APPROVED BY THE ENGINEER.

DATUM

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

MATERIALS

CONCRETE

1. THE COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE:

   PRESTRESSED CONCRETE:
   f'_{ci} = 5,000 PSI (AT TRANSFER)
   f'_c = 7,000 PSI (28 –DAY)

   REMAINING:
   f'_c = 5,000 PSI (28 –DAY)

2. CONCRETE AGGREGATE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN THE CURRENT EDITION OF ASTM C33. COARSE AGGREGATE SHALL BE SIZE NO. 67.

PRESTRESSING STRANDS

1. PRESTRESSING STRAND SHALL BE 0.6–INCH DIAMETER, SEVEN–WIRE, UNCOATED, LOW–RELAXATION STRAND WHICH IS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN ASTM A416. THE STRAND SHALL HAVE AN ULTIMATE TENSILE STRENGTH OF 270 KSI. THE INITIAL PRESTRESS SHALL BE 43,400 LBS. PER STRAND UNLESS NOTED OTHER OTHERWISE.

2. STRAND SHALL BE TESTED IN ACCORDANCE WITH PCI RECOMMENDATIONS (MOUSTAFA METHOD) AND CERTIFIED BY THE FABRICATOR AS HAVING ADEQUATE BOND CHARACTERISTICS TO SATISFY THE PREDICTION EQUATIONS FOR TRANSFER AND DEVELOPMENT LENGTH GIVEN IN THE AREMA MANUAL FOR RAILWAY ENGINEERING.

3. AN ALTERNATE STRAND PATTERN WHICH HAS THE SAME ECCENTRICITY AS THE PATTERN SHOWN ON THIS PLAN AND IS BETTER SUITED TO THE MANUFACTURE'S FACILITIES WILL BE CONSIDERED. MANUFACTURER MUST SUBMIT PLAN AND COMPUTATIONS FOR RAILROAD APPROVAL PRIOR TO CASTING.

REINFORCING STEEL

1. REINFORCING STEEL SHALL BE DEFORMED AND EPOXY COATED, PER CURRENT ASTM A615 SPECIFICATIONS AND MUST MEET GRADE 60 REQUIREMENT. EPOXY COATING SHALL BE IN ACCORDANCE WITH ASTM A775.

2. FABRICATION OF REINFORCING STEEL SHALL BE PER CHAPTER 7 OF THE CRSI MANUAL OF STANDARD PRACTICE. DIMENSIONS OF BENDING DETAILS ARE OUT–TO–OUT OF BAR.

3. REINFORCING STEEL IS TO BE BLOCKED TO PROPER LOCATION AND SECURELY WIRED AGAINST DISPLACEMENT. USE PLASTIC PROTECTED REINFORCING SUPPORTS MEETING CRSI SPECIFICATIONS CHAPTER 3, CLASS 1. TACK WELDING OF REINFORCING IS PROHIBITED. MINIMUM CONCRETE ON REINFORCEMENT SHALL MEET CURRENT AREMA REQUIREMENTS.

   MINIMUM CONCRETE COVER
   DECK SLAB : 1 1/2 INCHES.
   REMAINDER : 2 INCHES, UNLESS OTHERWISE NOTED.

STEEL

1. STRUCTURAL STEEL PLATES AND BARS SHALL MEET THE REQUIREMENTS OF THE CURRENT ASTM DESIGNATION: A709, GR. 36. UNLESS OTHERWISE NOTED.

2. PILING SHALL BE STEEL H–PILES, ASTM A572, GRADE 50.

3. STEEL SHEET PILING SHALL BE UNCOATED HOT–ROLLED STEEL PZ 35 SECTIONS MEETING THE CHEMICAL AND MECHANICAL REQUIREMENTS OF ASTM A572 GRADE 50.

4. ALL WELDING AND THE PREPARATION AND ASSEMBLY OF MATERIAL FOR WELDING SHALL BE IN ACCORDANCE WITH THE BRIDGE WELDING CODE, ANSI/AASHTO/AWS D1.5. ELECTRODES SHALL BE E70XX.

GALVANIZING

1. ALL STEEL PIPES, ANGLES, CHANNEL AND DECK PLATES SHALL BE HOT–DIPPED GALVANIZED PER ASTM A123.

2. BOLTS, NUTS, INSERTS NUTS AND WASHERS SHALL BE GALVANIZED ACCORDING TO ASTM A153 (HOT DIP PROCESS) OR ACCORDING TO ASTM B695, CLASS 50. TYPE 1 (MECHANICAL PROCESS).

PAINTING

1. THE EXPOSED PORTION OF ANY STEEL (PILE PLATES, BRACKETS, LONGITUDINAL RESTRAINT BRACKETS, EMBEDDED PLATES, ETC.) SHALL BE PAINTED WITH ONE FIELD COAT OF CHEMICAL MASTIC CM–15 (OR APPROVED EQUAL), METALLIC ALUMINUM COLOR, APPLIED TO A DRY FILM THICKNESS OF 8 MILS. CORRESPONDING TO A WET FILM THICKNESS OF 10 MILS. PAINT APPLICATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTION.

2. INFORMATION PERTAINING TO CHEMICAL MASTIC CM–15 (OR APPROVED EQUAL) CAN BE OBTAINED FROM THE MANUFACTURER.

FABRICATION

CONCRETE

1. PRODUCTION PROCEDURES AND DIMENSIONAL TOLERANCES FOR THE MANUFACTURE OF PRECAST. PRESTRESSED GIRDERS SHALL BE IN ACCORDANCE WITH THE AREMA MANUAL FOR RAILWAY ENGINEERING AND THE PRESTRESSED CONCRETE INSTITUTES CURRENT MANUALL MNL –116 FOR QUALITY CONTROL.

2. TOLERANCE FOR LOCATION OF LIFTING LOOPS SHALL BE ± 1/2".

3. THE ENDS OF THE STRANDS SHALL BE CUT OFF FLUSH WITH THE END OF THE BEAM AND PAINTED. RECESSES AND MINOR SPALLS MUST BE FILLED AND FINISHED TO THE PLAN DIMENSIONS USING AN EPOXY BONDING COMPOUND AND GROUT.

4. CONCRETE CURB SHALL BE CAST AFTER THE GIRDER IS REMOVED FROM THE FORM.

5. CONCRETE BONDING AGENT: REFER TO SPECIFICATIONS.

6. SURFACES SHALL BE FORMED IN A MANNER WHICH WILL PRODUCE A SMOOTH AND UNIFORM APPEARANCE WITHOUT RUBBING OR PLASTERING. UNLESS OTHERWISE NOTED, EXPOSED EDGES OF 90–DEGREES OR LESS ARE TO BE CHAFFERED 3/4"X 3/4". UNFORMED SURFACES SHALL HAVE A SMOOTH FINISH FREE OF ALL FLOAT AND TROWEL MARKS.

7. THE FABRICATOR SHALL STENCIL THE FABRICATOR'S NAME, DATE OF FABRICATION PLACE MARK AND LIFTING WEIGHT ON EACH PIECE.

8. FABRICATOR IS RESPONSIBLE FOR ADEQUACY OF LIFTING DEVICES.

9. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.

10. ALL BAR–BENDING AND STANDARD HOOK DIMENSIONS SHALL BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE" AS PUBLISHED BY THE CONCRETE REINFORCING STEEL INSTITUTE UNLESS OTHERWISE SHOWN OR NOTED.

CONSTRUCTION

GENERAL

1. THERE IS NO CONSTRUCTION STAGING AREA AT THE JOB SITE DESIGNATED. AS REQUIRED, THE CONTRACTOR SHALL PROVIDE HIS/HER OWN OFF–SITE STAGING AREA.

2. THE CONTRACTORS'S ATTENTION IS CALLED TO THE FACT THAT CONTINUOUS COORDINATION WITH THE OPERATOR, HOUSATONIC RAILROAD COMPANY (HRRC), WILL BE REQUIRED THROUGHOUT CONSTRUCTION. HRRC WILL PROVIDE THE CONTRACTOR WITH FLAGGERS FOR PROTECTION FROM RAILROAD TRAFFIC WHILE WORK IS BEING PERFORMED ON THE RAILROAD RIGHT–OF–WAY (R.O.W.). THE CONTRACTOR SHALL NOT ENTER THE R.O.W. AT ANYTIME WITHOUT HRRC AUTHORIZATION. THE CONTRACTOR WILL ALSO BE REQUIRED TO OBTAIN R.O.W. TRAINING PRIOR TO WORKING IN THE R.O.W.

3. ALL WORK SHALL BE PERFORMED DURING A SERIES OF SHUTDOWNS OF RAILROAD TRAFFIC. THE CONTRACTOR SHALL COORDINATE ALL SHUTDOWNS WITH HRRC. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION REGARDING SPECIFIC DATES, LENGTH OF SHUTDOWNS, AND LIQUIDATED DAMAGE PENALTIES FOR EXCEEDING AUTHORIZED TIME LIMITS.

4. ALL CONSTRUCTION AND ACCESS SHALL BE WITHIN THE R.O.W. UNLESS OTHERWISE APPROVED BY THE PROPERTY OWNER(S) AND MASSDOT. THE CONTRACTOR SHALL COORDINATE DIRECTLY WITH THE PROPERTY OWNER(S) TO OBTAIN WRITTEN APPROVAL OF LAND USE OUTSIDE THE R.O.W. THE CONTRACTOR SHALL SUBMIT COPIES OF WRITTEN PROPERTY AGREEMENTS TO THE RESIDENT ENGINEER.

5. ANY DAMAGE TO REMAINING EXISTING COMPONENTS THAT IS CAUSED BY THE CONTRACTOR'S ACTIVITY SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AS DIRECTED AND APPROVED BY THE ENGINEER, AT NO ADDITIONAL EXPENSE TO THE BRIDGE OWNER OR RAILROAD OPERATOR.

6. THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO ALL AREAS OF WORK ON THE BRIDGE FOR THE ENGINEER'S INSPECTIONS. COSTS SHALL BE INCLUDED IN MOBILIZATION.

7. ALL EXISTING MATERIALS NOT REUSED OR RESET AS PART OF THIS PROJECT SHALL BE CONSIDERED WASTE MATERIAL. ALL WASTE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF. ALL TREATED TIMBER SHALL BE DISPOSED OF ONLY AT AN APPROVED FACILITY.

8. COORDINATE RAIL TRAFFIC SHUTDOWNS AND THE USE OF TEMPORARY STAGING AREA DURING THE SHUTDOWN WITH THE RAILROAD.

MORTAR FOR SETTING BEAM

1. BEAMS SHALL HAVE FULL AND EVEN BEARING UPON THE BRIDGE SEAT AREAS. IF NEEDED, MORTAR CONSISTING OF EQUAL PARTS BY VOLUME OF CLASS B EPOXY AND DRY SILICA SAND, FIXED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, SHALL BE SPREAD ON THE TOP OF BEARING PADS TO OBTAIN UNIFORM BEARING. SCRAPE EXCESS MORTAR FROM AROUND BEARING PADS AFTER THE BEAMS ARE SET.

2. AFTER PRECAST CONCRETE MEMBERS ARE SET. THE ENDS OF THE LIFTING LOOP STRANDS SHALL BE BURNED OFF AND RECESSED TO A DEPTH OF 1 INCH. FILL RECESSES AT LIFT ANCHORS WITH CEMENT GROUT TO TOP OF SURROUNDING CONCRETE.

ENVIRONMENTAL:

1. THE CONTRACTOR SHALL PREVENT ANY CONSTRUCTION DEBRIS FROM ENTERING THE WATERWAYS, PUBLIC OR PRIVATE PROPERTY, OR TRAVELED WAYS DURING CONSTRUCTION. ALL WASTE MATERIAL GENERATED AS PART OF THIS PROJECT SHALL BE DISPOSED OF OFF SITE.

2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE STATUTES AND REGULATIONS RELATING TO THE PREVENTION AND ABATEMENT OF ALL POLLUTION.

3. SEE SPECIFICATIONS FOR REQUIREMENTS FOR WORKING AT PROJECT SITE.

ABBREVIATIONS:

B.F.	BACK FACE
BOT.	BOTTOM
E.F.	EACH FACE
EL. OR ELEV.	ELEVATION
EQ. SP.	EQUALLY SPACED
F.F.	FRONT FACE
R/F	REINFORCEMENT
TYP.	TYPICAL
W.P.	WORKING POINT

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

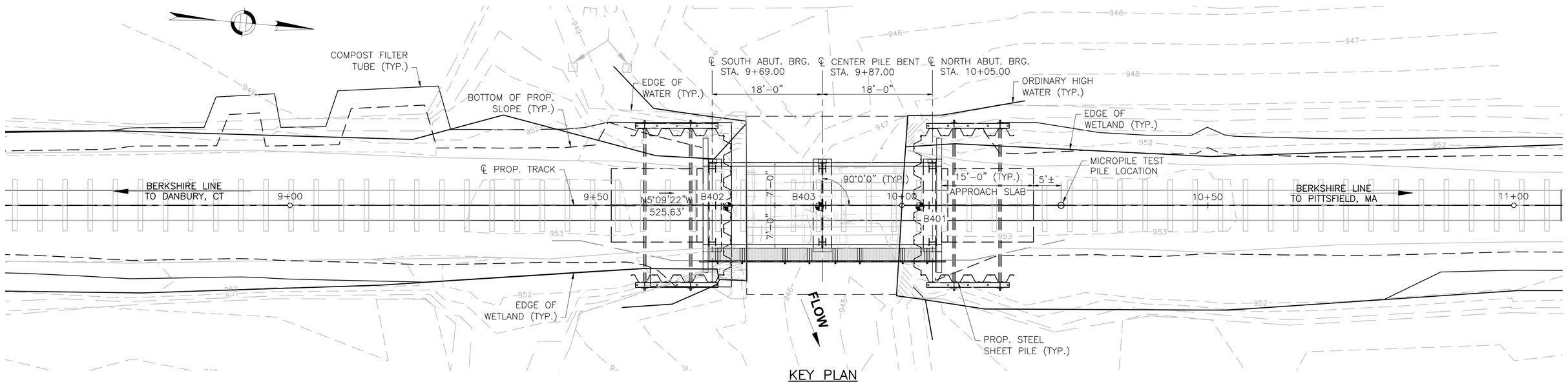
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
STRUCTURAL GENERAL NOTES

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

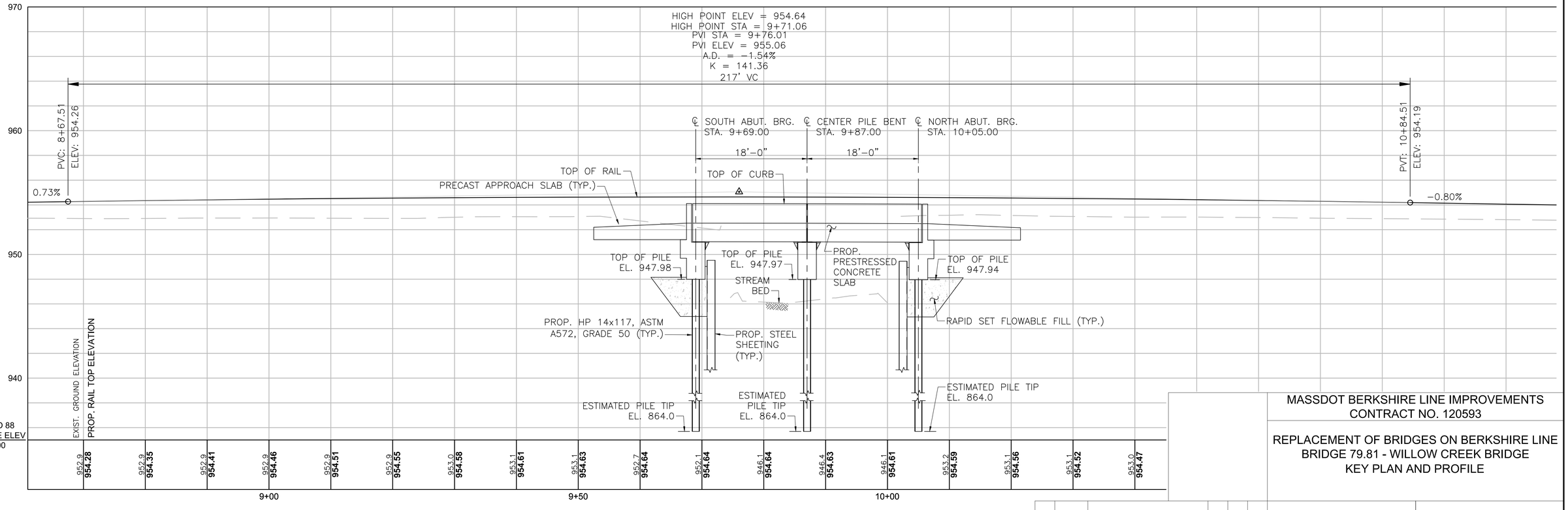
MassDOT Massachusetts Department of Transportation
Rail & Transit Division

SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	JQW	JQW	SSL	SHEET: S–1	



KEY PLAN

SCALE: 1/8" = 1'-0"



PROFILE

HORIZONTAL SCALE: 1/8" = 1'-0"

VERTICAL SCALE: 1/4" = 1'-0"

NOTES:

MICROPILE OPTION NOT SHOWN FOR CLARITY. SEE SHEET S-8A FOR DETAILS.

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
KEY PLAN AND PROFILE

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

massDOT Massachusetts Department of Transportation Rail & Transit Division

SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	SSL	SSL	JQW	SHEET: S-2	

BORING B402

BORING INFORMATION
LOCATION: Bridge 79.90, South Abutment
GROUND SURFACE EL. (ft): 953.7 **DATE START/END:** 10/4/2018 - 10/8/2018
VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Aquifer Drilling and Testing, Inc.
TOTAL DEPTH (ft): 98.0 **DRILLER NAME:** Tim Van Ness
LOGGED BY: D. Litton **RIG TYPE:** CME Hi-Rail Mounted Truck Rig

BORING B402
PAGE 1 of 4

DRILLING INFORMATION
HAMMER TYPE: Automatic **CASING I.D./O.D.:** 4 inch / 4.5 inch **CORE BARREL TYPE:** NX
AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** 2.675 inch **CORE BARREL I.D./O.D.** 2 inch / 3 inch
DRILLING METHOD: Driven casing and washed with rotary tooling.
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
							SAND AND GRAVEL	(0-6"): BALLAST. S1: WIDELY GRADED SAND WITH GRAVEL (SW); ~50% fine to coarse sand, ~45% fine to coarse gravel, ~5% non-plastic fines; black; moist. <FILL>
950	5	S1	0.5 to 2.5	24/4	5-6-5-3			
		S2	2.5 to 4.5	24/3	6-8-12-10			S2: WIDELY GRADED GRAVEL WITH SAND (GW); ~80% fine to coarse gravel, ~15% fine to coarse sand, ~5% non-plastic fines; brown to black; wet. <FILL>
						Wood in drill wash ~4 ft.		
						Drill through timber.		
						Drill wash color change ~6 ft.	SILT AND SAND	
945	10	S3	7 to 9	24/11	4-4-6-7			S3: SILT WITH SAND (ML); ~85% non-plastic fines, 15% fine sand; gray; wet.
		S4	9 to 11	24/19	9-13-11-15			S4: SILTY SAND (SM); ~70% fine sand, ~30% non-plastic fines; gray; wet.
						Mix mud. Continue open hole.		
940	15	S5	14 to 16	24/10	8-9-3-4			S5: SILTY SAND (SM); ~65% fine to medium sand, ~30% non-plastic fines, ~5% fine gravel; brown; wet. Wood fibers.
935	20	S6	19 to 21	24/13	5-9-6-8			S6: SILTY SAND (SM); Similar to S3.
930	25	S7	24 to 26	24/14	7-7-6-9			S7: SILT WITH SAND (ML); ~85% non-plastic to low plastic fines, ~15% fine sand; gray; wet. ~7 inch timber in spoon. Wood grain parallel to spoon.
925	30	S8	29 to 31	24/18	9-12-7-10			S8: SILTY SAND (SM); ~60% fine to medium sand, ~40% non-plastic fines; tan to gray; wet. Wood fibers.
920	35	S9	34 to 36	24/15	2-2-3-2	Use paint screen to clean timber fibers from tub.		S9: SILT WITH SAND (ML); ~75% non-plastic to low plastic fines, ~25% fine sand; gray with tan seams; wet.
915	40	S10	39 to 41	24/10	3-4-3-3			S10: SANDY SILT (ML); ~60% non-plastic fines, ~40% fine sand; tan; wet.
910	45	S11	44 to 46	24/13	2-2-2-1			S11: SANDY SILT (ML); Similar to S10, except gray.
905	50	S12	49 to 51	24/14	2-2-3-2			S12: LEAN CLAY WITH SAND (CL); ~85% low plastic fines, ~15% fine sand; gray with tan bands.
900	55	S13	54 to 56	24/10	3-3-4-5			S13: SANDY SILT (ML); ~60% non-plastic fines, ~40% fine sand; tan; wet.

TOP OF SOUTH ABUTMENT PILE ELEV. 947.98

BORING B402 (CONTINUED)

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
895	60	S14	59 to 61	24/12	3-6-6-10		SILT AND SAND	S14: SILT WITH SAND (ML); ~75% non-plastic fines, ~25% fine sand; gray; wet.
890	65	S15	64 to 66	24/17	4-4-6-10		GLACIAL OUTWASH	S15: SILTY SAND (SM); ~55% fine sand, ~45% non-plastic fines; tan; wet.
885	70	S16	69 to 71	24/8	6-10-11-12			S16: SILTY SAND (SM); ~65% fine sand, ~35% non-plastic fines; tan; wet.
880	75	S17	74 to 76	24/10	6-32-45-23			S17 (0-6"): SILTY SAND (SM); Similar to S15.
						Rig chatter from 76 to 79 ft.	GLACIAL TILL	S17 (6"-10"): WIDELY GRADED GRAVEL (GW); ~85% fine to coarse gravel up to 1-inch, ~10% fine to coarse sand, ~5% non-plastic fines; gray; wet.
875	80	S18	79 to 81	24/15	54-34-27-45	Possible boulder ~78 ft.		S18: WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM): ~50% fine to coarse sand, ~40% fine to coarse gravel, ~10% non-plastic fines; tan to gray; wet.
870	85	S19	84 to 85.8	22/16	45-86-80-100/4"	Rig chatter from 81 to 84 ft.		S19: SILTY GRAVEL WITH SAND (GM); ~60% fine to coarse gravel, ~20% fine to coarse sand, ~20% non-plastic fines; tan, gray, and white; wet. Rock seam from 8"-10".
865	90	C1	88 to 93	60/49	71	Core times (min/ft): 4, 6, 4, 6, 4	DOLOMITIC MARBLE	C1: DOLOMITIC MARBLE: Hard, joint ~60 degrees at 8" - 10", near horizontal joints at 14", 36", 47", moderately fractured from 5" - 11" , lightly weathered joints. 0 to 5", 14" to 36", and 36" to 47" single piece, white.
860	95	C2	93 to 98	60/32	50	Core times (min/ft): 3, 3, 5, 4, 4		C2: DOLOMITIC MARBLE; Hard, joints between 10 and 45 degrees at 5", 12", 24", 28", and 30", severely fractured 0-5", lightly weathered joints, light gray to white.
855	100							Bottom of boring at depth 98 ft. Borehole backfilled with tremie grout to existing grade.
850	105							
845	110							
840	115							

NOTES: Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineers, LLC dated November 21, 2018.

PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 79.90
CITY/STATE: Lenox, Massachusetts
GEI PROJECT NUMBER: 1703257
GEI Consultants

ESTIMATED PILE TIP ELEV. 864.0 FOR H-PILES

ESTIMATED PILE TIP ELEV. 855.0 FOR MICROPILE

BORING NOTES:

1. LOCATION OF BRIDGE BORINGS SHOWN ON THE PLAN THUS: ◕ B#
2. BORINGS ARE TAKEN FOR PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOG WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN BLOW COUNT COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 2" O.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. ALL BORINGS WERE MADE IN OCTOBER, 2018.
6. THE BORINGS WERE MADE BY AQUIFER DRILLING AND TESTING, INC. OF MINEOLA, NEW YORK.
7. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

BORING B403

BORING INFORMATION
LOCATION: Bridge 79.90, Mid-span
GROUND SURFACE EL. (ft): 953.7 **DATE START/END:** 10/9/2018 - 10/9/2018
VERTICAL DATUM: NAVD 88 **DRILLING COMPANY:** Aquifer Drilling and Testing, Inc.
TOTAL DEPTH (ft): 32.0 **DRILLER NAME:** Tim Van Ness
LOGGED BY: D. Litton **RIG TYPE:** CME Hi-Rail Mounted Truck Rig

BORING B403
PAGE 1 of 2

DRILLING INFORMATION
HAMMER TYPE: Automatic **CASING I.D./O.D.:** 4 inch / 4.5 inch **CORE BARREL TYPE:** NA
AUGER I.D./O.D.: NA / NA **DRILL ROD O.D.:** 2.675 inch **CORE BARREL I.D./O.D.** NA / NA
DRILLING METHOD: Spun and driven casing and washed with rotary tooling.
WATER LEVEL DEPTHS (ft): ▽ 3.3 10/9/2018 8:58 am

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
950	5	S1	6 to 8	24/8	1-1-2-8		S & G	S1: WIDELY GRADED GRAVEL WITH SILT AND SAND (GW-GM); 56.6% fine to coarse angular gravel, 32.6% fine to coarse sand, 10.8% non-plastic fines (from grain size analysis); black; wet. 4-inch timber in spoon. <FILL>
		S2	8 to 10	24/16	34-38-84-33			S2 (0-6"): SILTY GRAVEL WITH SAND (GM); ~60% fine to coarse gravel, ~25% non-plastic to low plastic fines, ~15% fine to coarse sand; black; wet.
945	10	S3	10 to 12	24/15	17-19-20-16			S2(6"-16"): SILTY SAND WITH GRAVEL (SM) ~40% fine to coarse sand, ~30% non-plastic fines, ~30% fine to coarse gravel; gray; wet. S3: SILT (ML); 94.6% non-plastic fines, 5.4% fine sand (from grain size analysis); gray; wet.
		S4	12 to 14	24/11	16-17-18-26			S4: SILT WITH SAND (ML); ~75% non-plastic to low plastic fines, ~20% fine to coarse sand, ~5% fine gravel; gray; wet.
940	15	S5	14 to 16	24/18	20-26-30-33		SILT AND SAND	S5: SANDY SILT (ML); 72.1% non-plastic fines, 27.9% fine sand (from grain size analysis); gray; wet.
935	20	S6	20 to 22	24/16	10-17-18-17			S6: SILT (ML); 89.7% non-plastic fines, 10.3% fine sand (from grain size analysis); gray; wet.
930	25	S7	25 to 27	24/12	3-3-5-10			S7: SILT (ML); ~90% non-plastic to low plastic fines; ~10% fine sand; gray to tan; wet.
925	30	S8	30 to 32	24/20	4-4-5-5			S8: SILT WITH SAND (ML); ~80% non-plastic fines, ~20% fine sand; gray and tan; wet.
920	35							Bottom of boring at depth 32 ft. Borehole backfilled with tremie grout to existing grade.
915	40							
910								

TOP OF CENTER PIER PILE ELEV. 947.97

NOTES: Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineers, LLC dated November 21, 2018. S1-S3 were taken with a 3-inch split spoon. Debris and organics were resting on top of stream bed.

PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 79.90
CITY/STATE: Lenox, Massachusetts
GEI PROJECT NUMBER: 1703257
GEI Consultants

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
BORING SHEET 1 OF 2

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 307-7700

massDOT Massachusetts Department of Transportation Rail & Transit Division

SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	SSL	SSL	JQW	SHEET: S-3	

BORING B401

BORING INFORMATION

LOCATION: Bridge 79.90, North Abutment
GROUND SURFACE EL. (ft): 953.7
VERTICAL DATUM: NAVD 88
TOTAL DEPTH (ft): 89.8
LOGGED BY: D. Litton
DATE START/END: 10/2/2018 - 10/3/2018
DRILLING COMPANY: Aquifer Drilling and Testing, Inc.
DRILLER NAME: Tim Van Ness
RIG TYPE: CME Hi-Rail Mounted Truck Rig

BORING
B401
PAGE 1 of 4

DRILLING INFORMATION

HAMMER TYPE: Automatic
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Driven casing and washed with rotary tooling.
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: 4 inch / 4.5 inch
DRILL ROD O.D.: 2.675 inch
CORE BARREL TYPE: NA
CORE BARREL I.D./O.D. NA / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

TOP OF NORTH ABUTMENT PILE ELEV. 947.94

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
							SAND AND GRAVEL	(0-1'): BALLAST.
950	5	S1	1 to 3	24/7	8-4-4-4			S1: SILTY SAND WITH GRAVEL (SM); ~60% fine to coarse sand, ~25% fine to coarse gravel, ~15% non-plastic fines; brown to black; wet. <FILL>
		S2	3 to 5	24/2	4-8-11-9			S2: SANDY LEAN CLAY (CL); ~60% low plastic fines, ~30% fine to medium sand; gray with black; wet. <FILL>
		S3	5 to 7	24/13	7-6-5-8		SILT AND SAND	S3: SILT WITH SAND (ML); ~65% non-plastic fines, ~25% fine sand; gray; wet.
945	10	S4	7 to 9	24/14	12-12-14-14	~10 ft, mix bentonite clay. Rig chatter ~11 ft.		S4: SILT WITH SAND (ML); Similar to S3.
940	15	S5	14 to 16	24/16	12-11-6-4			S5: SILTY SAND (SM); ~55% fine sand, ~45% non-plastic to low plastic fines; tan; wet.
935	20	S6	19 to 21	24/14	12-16-17-15			S6: SILTY SAND (SM); Similar to S5.
930	25	S7	24 to 26	24/15	6-6-7-10			S7: SILTY SAND (SM); ~55% fine sand, ~45% non-plastic to low plastic fines; light brown; moist.
925	30	S8	29 to 31	24/15	4-3-4-5			S8: SANDY SILT (ML); ~65% non-plastic fines; ~35% fine sand; gray; wet. Liquifies with vibration / shaking.
920	35	S9	34 to 36	24/21	3/12"-1-1			S9: SANDY SILT (ML); Similar to S8.
915	40	S10	39 to 41	24/18	2-1-3-3			S10: SILTY SAND (SM); ~70% fine to medium sand, ~30% non-plastic fines; gray; wet.
910	45	S11	44 to 46	24/18	1-2-1/12"			S11: SILTY SAND (SM); ~60% fine sand, ~40% non-plastic fines; gray; wet.
905	50	S12	49 to 51	24/18	3-2-3-3			S12: SILT WITH SAND (ML); ~60% non-plastic to low plastic fines, ~40% fine sand; tan and gray; wet.
900	55	S13	54 to 56	24/12	3-6-8-7			S13: SILTY SAND (SM); ~80% fine to medium sand, ~20% non-plastic fines; tan; wet.

BORING B401 (CONTINUED)

ESTIMATED PILE TIP ELEV. 864.0 FOR H-PILES

ESTIMATED PILE TIP ELEV. 855.0 FOR MICROPILE

Elev. (ft)	Depth (ft)	Sample No.	Sample Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
895	60	S14	59 to 61	24/11	4-7-7-10		SILT AND SAND	S14: SILTY SAND (SM); ~65% fine sand, ~35% non-plastic fines; tan; wet.
890	65	S15	64 to 66	24/14	WOH-6-7-8			S15: SILTY SAND (SM); Similar to S14, except gray with tan bands.
885	70	S16	69 to 71	24/9	8-10-10-14			S16: SILTY SAND (SM); ~85% fine to medium sand, ~15% non-plastic fines; tan; wet.
880	75	S17	74 to 76	24/8	8-11-13-16		GLACIAL OUTWASH	S17: WIDELY GRADED SAND WITH SILT (SW-SM); ~90% fine to coarse sand, 10% non-plastic fines; tan; wet.
875	80	S18	79 to 81	24/13	7-10-11-10			S18: WIDELY GRADED SAND WITH SILT (SW-SM); Similar to S17.
870	85	S19	84 to 86	24/8	35-42-30-44	Rig chatter ~84 ft.	GLACIAL TILL	S19: WIDELY GRADED GRAVEL WITH SAND AND SILT (GW-GM); ~60% fine to coarse gravel up to 1.5 inch, ~30% fine to coarse sand, ~10% non-plastic to low plastic fines; tan to white; wet.
865	90	S20	89 to 89.8	9/6	32-50/3"	Bit grinding between 86 to 89 ft.		S20: WIDELY GRADED GRAVEL WITH SAND AND SILT (GW-GM); ~60% fine to coarse gravel up to 1 inch, ~30% fine to coarse sand, ~10% non-plastic to low plastic fines; tan; wet. Till. Bottom of boring at depth 89.8 feet. Grout mix: 2 bags (94-lb) portland cement, 1 bag bentonite. Borehole backfilled with tremie grout to existing grade.
860	95							
855	100							
850	105							
845	110							
840	115							

NOTES: Depths referenced to top of rail. Top of rail elevation based on preliminary survey drawings from C&C Consulting Engineers, LLC dated November 21, 2018.

PROJECT NAME: MassDOT Berkshire Line Bridges, Bridge MP 79.90
CITY/STATE: Lenox, Massachusetts
GEI PROJECT NUMBER: 1703257
GEI Consultants

NOTE:

FOR BORING NOTES. SEE SHEET S-3.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

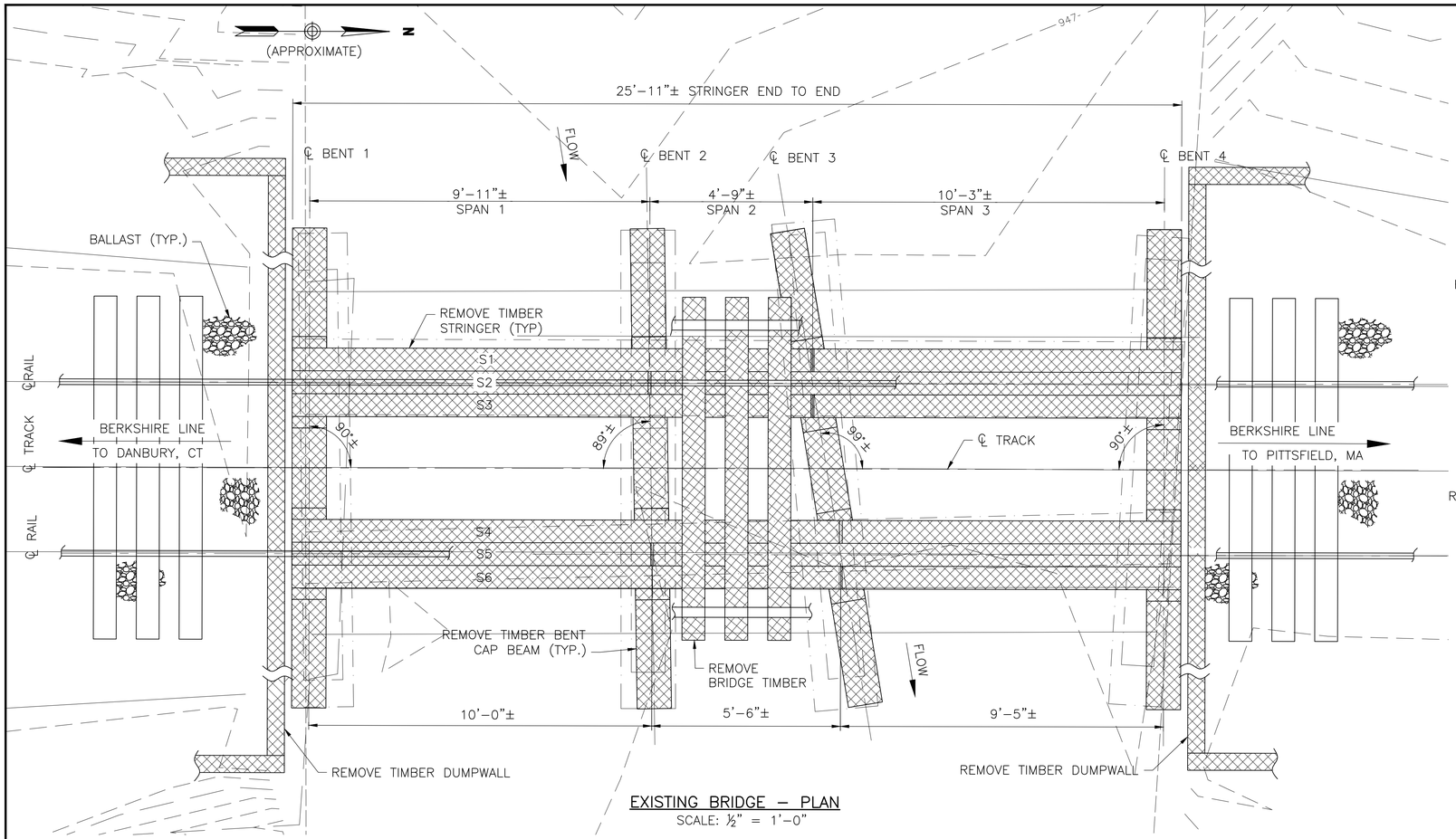
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
BORING SHEET 2 OF 2

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

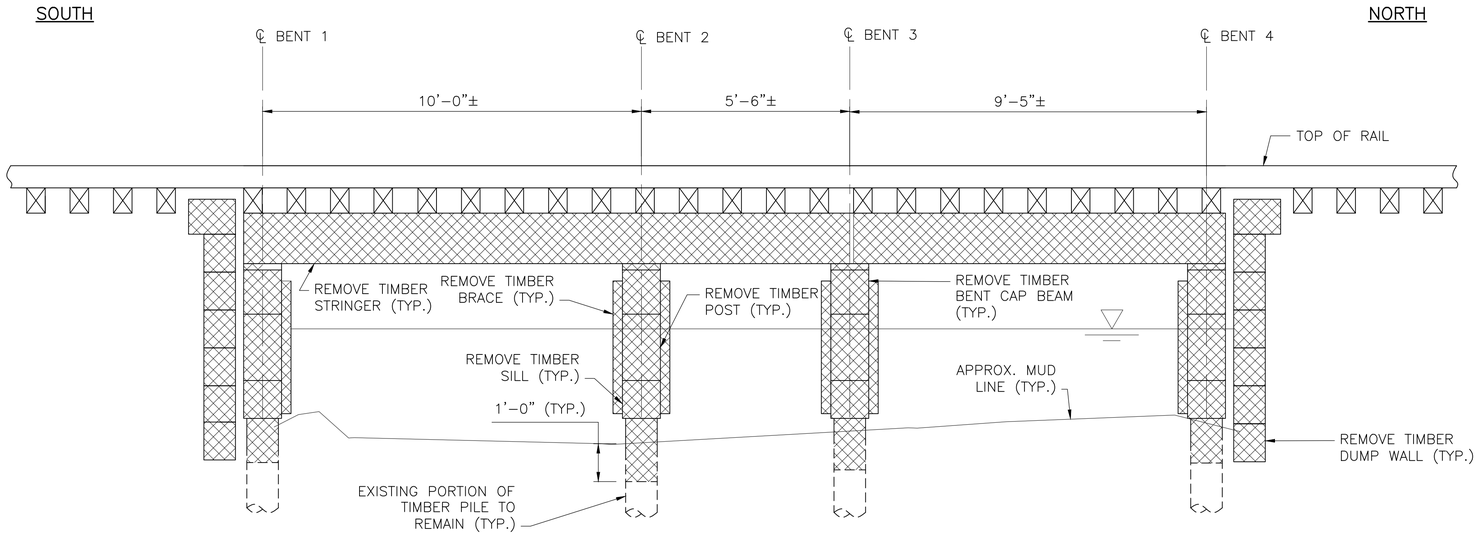
HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 307-7700

massDOT Massachusetts Department of Transportation Rail & Transit Division

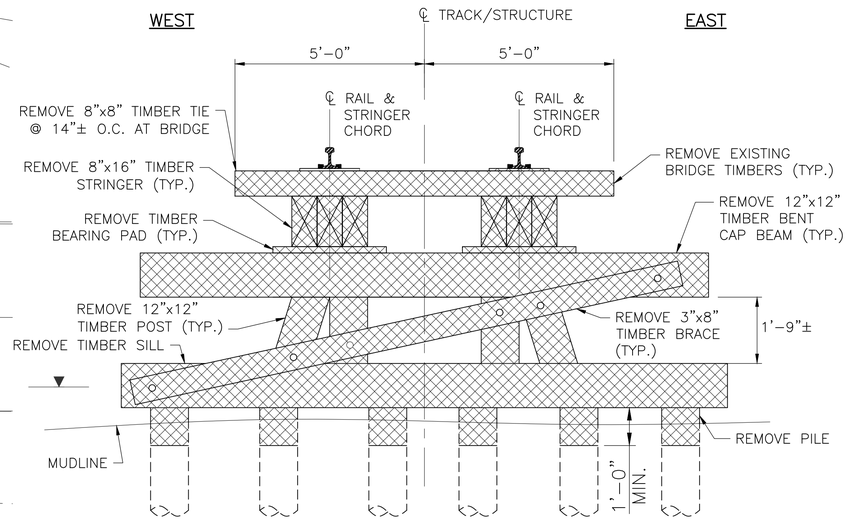
SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	SSL	SSL	JQW	SHEET: S-4	



EXISTING BRIDGE – PLAN
SCALE: ½" = 1'-0"



EXISTING BRIDGE ELEVATION
SCALE: ½" = 1'-0"



TYPICAL EXISTING BENT – ELEVATION
SCALE: ½" = 1'-0"

LEGEND:

EXISTING STRUCTURE REMOVAL

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

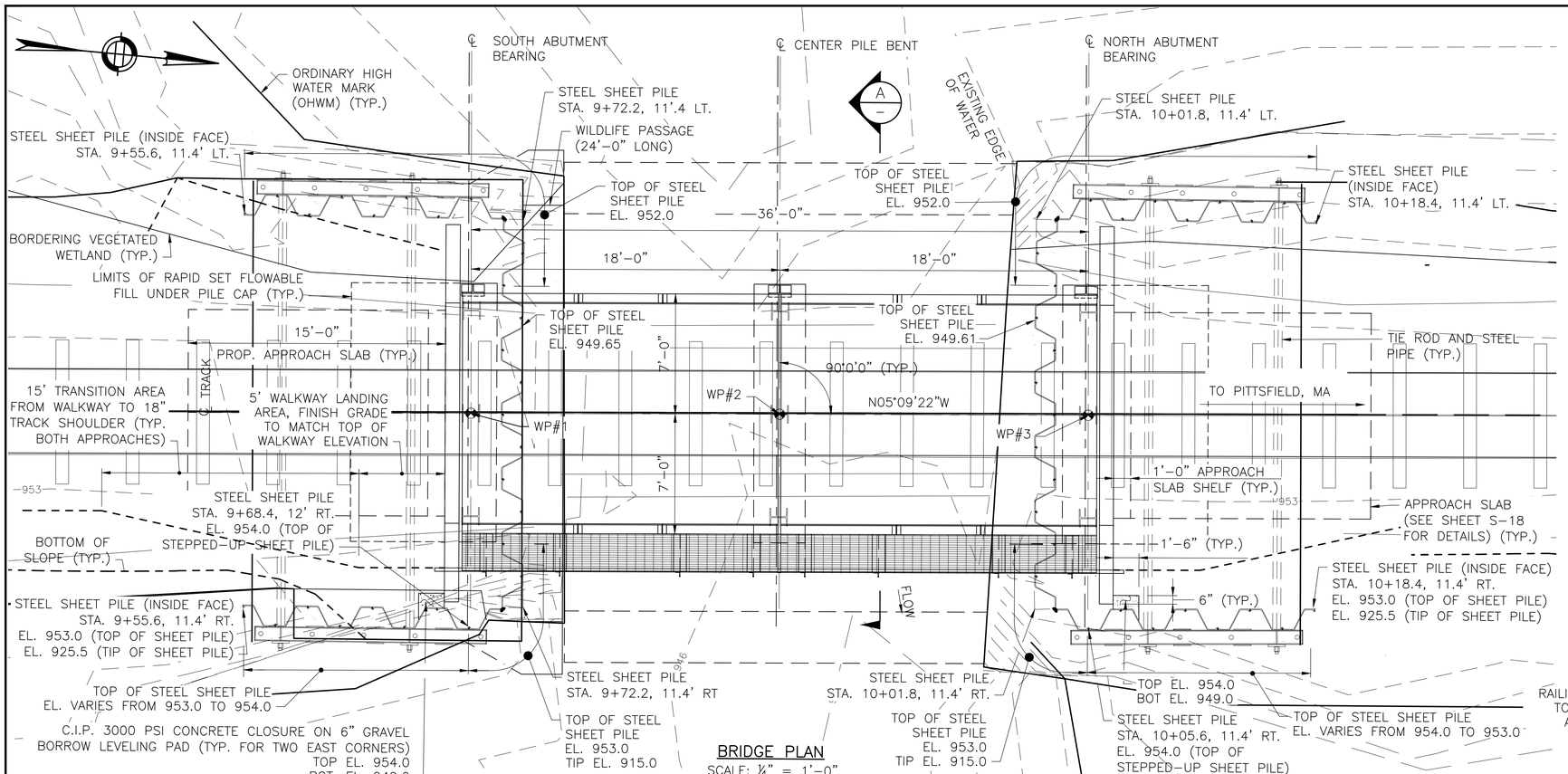
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
DEMOLITION LIMITS - PLAN AND ELEVATION

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

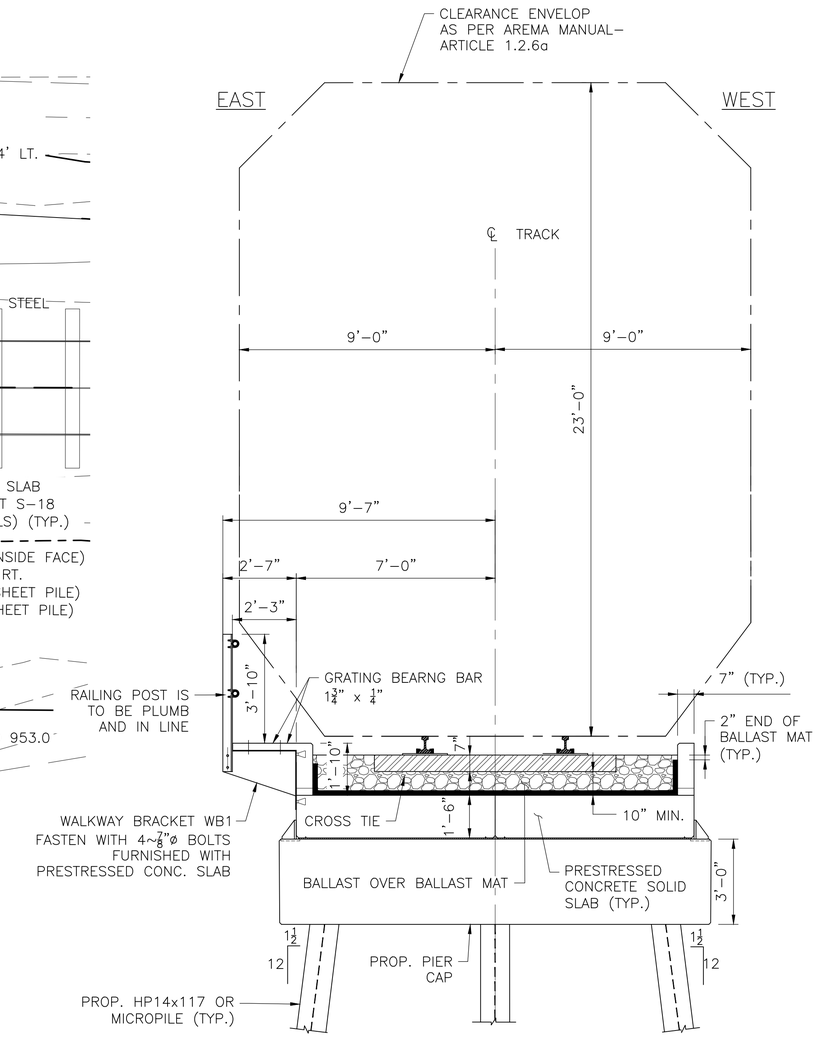
HDR, INC.
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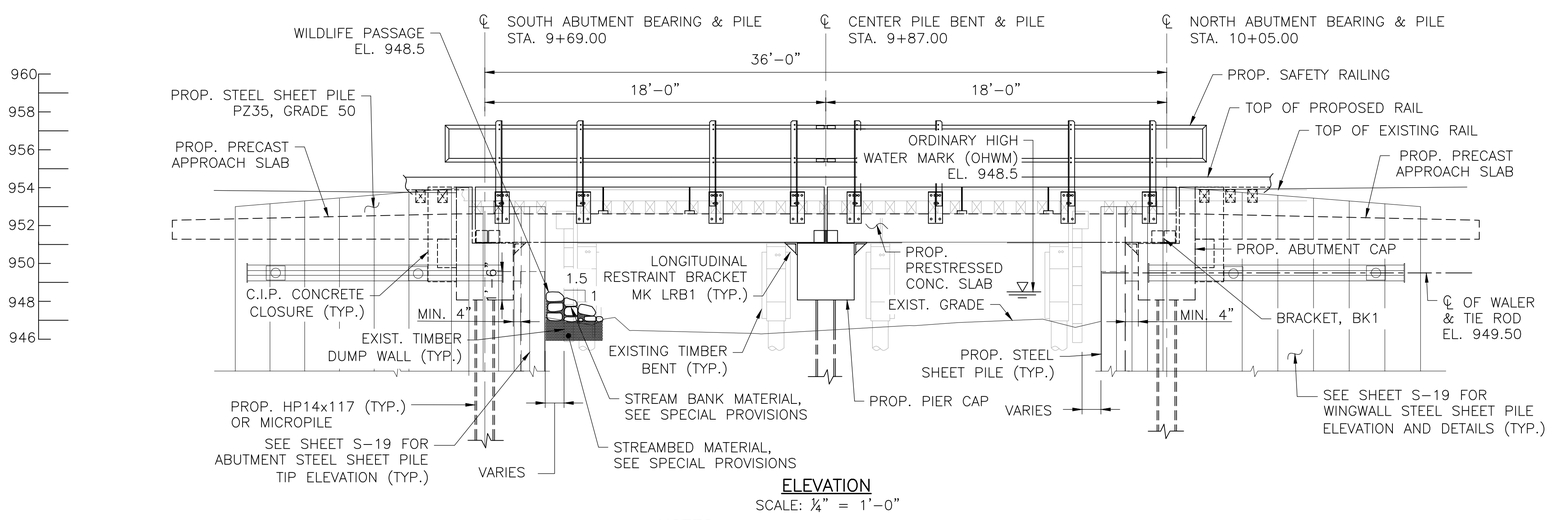
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BRIDGE PLAN
SCALE: ¼" = 1'–0"



SECTION A
SCALE: ⅜" = 1'–0"



ELEVATION
SCALE: ¼" = 1'–0"

WP#	STATION	NORTHING	EASTING	ELEVATION (TOP OF RAIL)
1	9+69.00	2961803.1298	184857.4770	954.64
2	9+87.00	2961821.0570	184855.8593	954.63
3	10+05.00	2961838.9841	184854.2416	954.60

NOTES:

1. FOR GENERAL NOTES, SEE SHEET S–1.
2. W.P ELEVATIONS CORRESPOND TO THE ELEVATION OF THE TOP OF THE RAIL AT STATION INDICATED.
3. FILL GAP BETWEEN END OF BEAM AND FACE OF BACKWALL WITH PLIES OF PREFORMED JOINT FILLER.
4. MICROPILE OPTION NOT SHOWN FOR CLARITY SEE SHEET S–8A FOR DETAILS.

ABBREVIATIONS:

W.P. WORKING POINT
TYP. TYPICAL

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

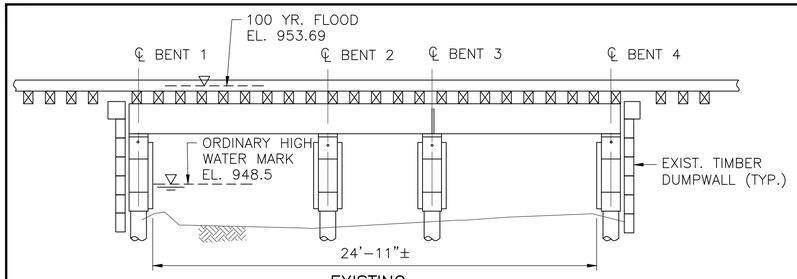
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PROPOSED BRIDGE PLAN & ELEVATION

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

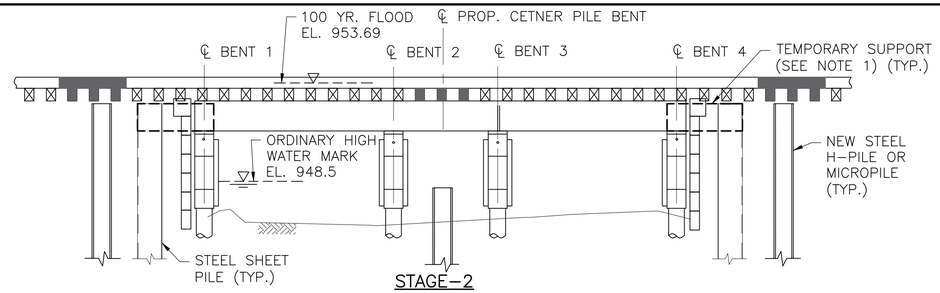
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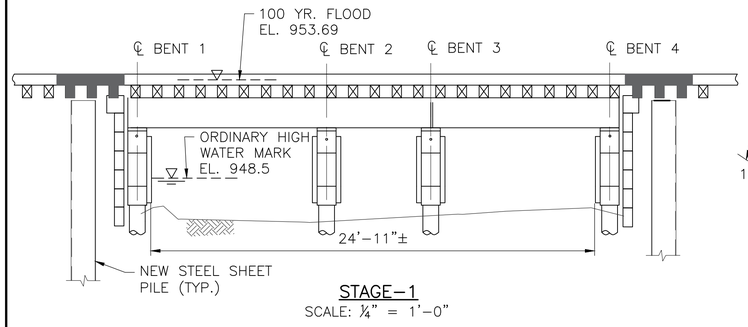
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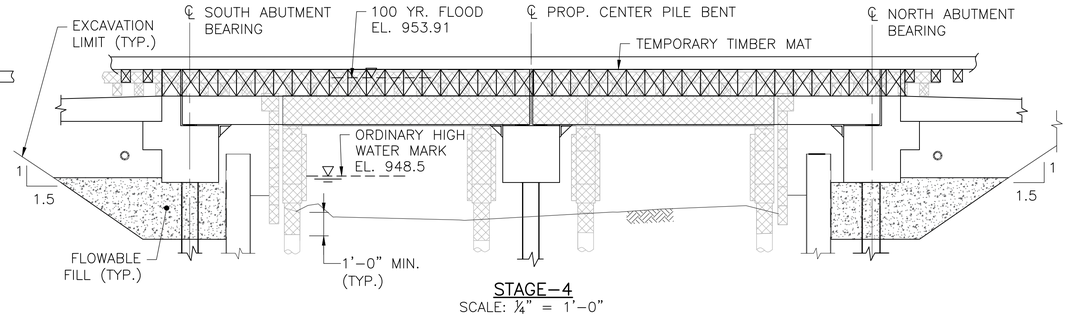
EXISTING
SCALE: ¼" = 1'-0"



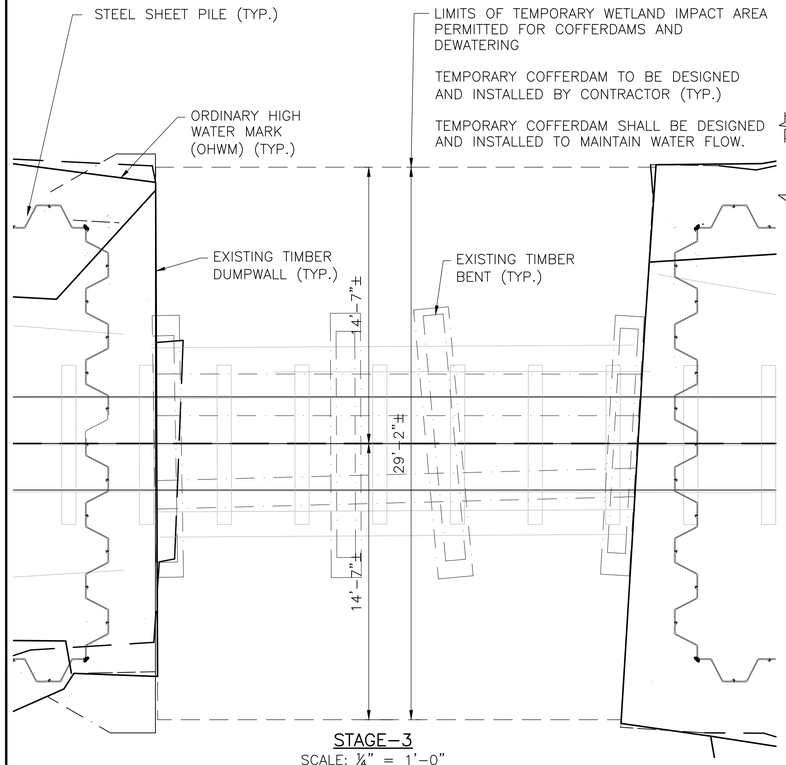
STAGE-2
SCALE: ¼" = 1'-0"



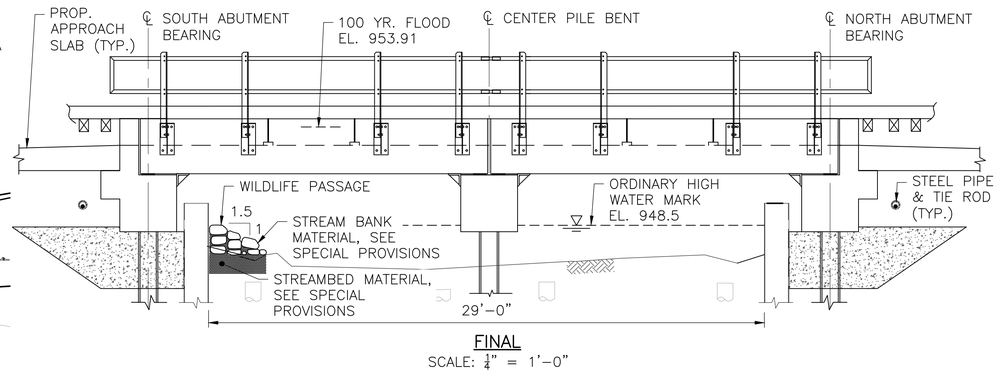
STAGE-1
SCALE: ¼" = 1'-0"



STAGE-4
SCALE: ¼" = 1'-0"



STAGE-3
SCALE: ¼" = 1'-0"



FINAL
SCALE: ¼" = 1'-0"

TEMPORARY SUPPORT NOTES:

1. TEMPORARY TRACK SUPPORT BETWEEN END BENTS AND PROPOSED SHEET PILE WALLS SHALL BE DESIGNED AND FABRICATED BY THE CONTRACTOR PRIOR TO CONSTRUCTION IN CASE EXISTING DUMP WALLS ARE DAMAGED DURING INSTALLATION OF SHEET PILES. DESIGN OF TEMPORARY SUPPORTS SHALL BE STAMPED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS AND SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL BEFORE FABRICATION. COST OF TEMPORARY SUPPORT SHALL BE INCIDENTAL TO STEEL SHEET PILE.
2. SHEET PILE WALLS AND BRACING SYSTEM SHOWN IN THESE DRAWINGS ARE FOR THE PERMANENT CONDITION. CONTRACTOR IS RESPONSIBLE FOR DESIGN OF THE SHEET PILE WALLS UNDER TEMPORARY CONDITIONS DURING CONSTRUCTION. DESIGN AND ANALYSIS OF THE SHEET PILE WALLS IN THE TEMPORARY CONDITION SHALL BE PREPARED AND STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF MASSACHUSETTS AND SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL BEFORE INSTALLATION. SHEET PILES SHALL BE ANALYZED FOR COOPER E80 LOADING AND CONSTRUCTION SURCHARGES. DESIGN SHALL INCLUDE CONSTRUCTION SEQUENCE, SHEET PILE TIP ELEVATIONS AND SIZES, TEMPORARY BRACING, AND CONSTRUCTION SURCHARGE CRITERIA INCLUDING MINIMUM SETBACKS.
3. THE CONTRACTOR SHALL PROVIDE LATERAL SUPPORTS FOR EXISTING PILE BENTS PRIOR TO INSTALLATION OF STEEL SHEET PILES AND PILES.

SUGGESTED CONSTRUCTION STAGING:

STAGE 1 – WORK WILL BE PERFORMED DURING WEEKEND CLOSURES

1. INSTALL LATERAL BRACING FOR EXISTING BENTS.
2. REMOVE EXISTING TIES AND RAILS TEMPORALLY TO FACILITATE INSTALLATION OF STEEL SHEET PILES.
3. INSTALL NEW STEEL SHEET PILES FOR NEW STRUCTURE AND INSTALL TEMPORARY TRACK SUPPORTS ONE ABUTMENT LOCATION AT A TIME AS NEEDED.
4. REINSTALL TIES AND RAILS.

STAGE 2 – WORK WILL BE PERFORMED DURING WEEKEND CLOSURES

1. REMOVE EXISTING TIES TEMPORALLY TO FACILITATE INSTALLATION OF PILES.
2. INSTALL PILES FOR NEW STRUCTURE ONE PIER/ABUTMENT LOCATION AT A TIME.
3. REINSTALL TIES.

STAGE 3 – WORK WILL BE PERFORMED DURING NON-OPERATION HOURS

1. INSTALL COFFERDAM.

STAGE 4 – WORK WILL BE PERFORMED IN THREE CONSECUTIVE WEEKEND CLOSURES

STAGE 4A – WORK WILL BE PERFORMED DURING 1st WEEKEND CLOSURE

1. REMOVE EXISTING BRIDGE SUPERSTRUCTURE, TIMBER PIERS AND ABUTMENTS INCLUDING TIES AND RAILS.
2. EXCAVATE AT PROPOSED ABUTMENT CAPS TO PROVIDE ACCESS FOR FIELD WELDING.
3. INSTALL AND WELD NEW PRECAST ABUTMENT AND PIER CAPS TO PRE-INSTALLED PILES.
4. BACKFILL EXCAVATED AREAS AT ABUTMENT CAPS.
5. INSTALL BEARINGS AND BRIDGE SUPERSTRUCTURE AND WELD RESTRAINT BRACKETS MK LRB1.
6. INSTALL TEMPORARY TIMBER MAT AND RAILS ON BRIDGE.
7. OPEN BRIDGE TO TRAIN SERVICE.

STAGE 4B – WORK WILL BE PERFORMED DURING 2nd WEEKEND CLOSURE

1. REMOVE EXISTING RAIL AND TIES AT BRIDGE AND APPROACHES.
2. EXCAVATE AT ABUTMENT CAPS FOR PLACEMENT OF RAPID SET FLOWABLE FILL.
3. BACKFILL AFTER FLOWABLE FILL HARDENS
4. INSTALL PIPES FOR STEEL TIE RODS AND INSTALL APPROACH SLABS.
5. REINSTALL TRACK AND OPEN BRIDGE TO TRAIN SERVICE.

SATGE 4C – WORK WILL BE PERFORMED DURING 3rd WEEKEND CLOSURE

1. REMOVE TEMPORARY TIMBER MAT AND RAILS ON BRIDGE
2. PERFORM TRACK WORK AT BRIDGE APPROACHES.
3. INSTALL BALLAST MAT, BALLAST, CROSS TIES AND RAILS
4. OPEN BRIDGE TO TRAIN SERVICE.

STAGE 5 – WORK WILL BE PERFORMED DURING NON-OPERATION HOURS

1. INSTALL WALES AND TIE RODS FOR STEEL SHEET PILES.
2. CUT TIMBER PILES AT 1 FOOT BELOW FINISH GRADE.
3. INSTALL WILDLIFE PASSAGE.
4. INSTALL BRIDGE WALKWAY AND RAILING.
5. REMOVE COFFERDAM

LEGEND:

TEMPORARY REMOVAL

EXISTING STRUCTURAL REMOVAL

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

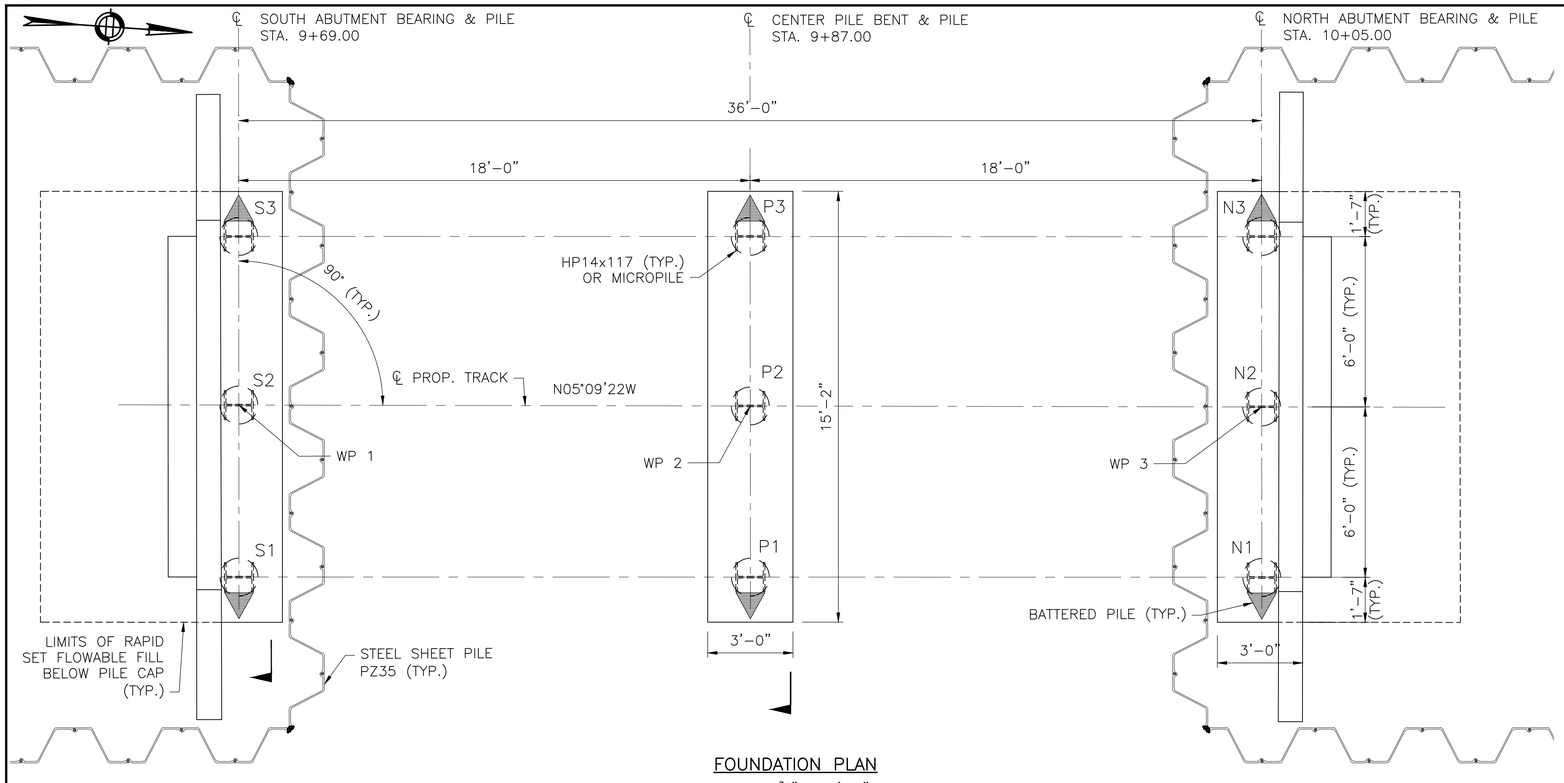
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
CONSTRUCTION STAGING

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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BOSTON, MA 02110
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FOUNDATION PLAN

SCALE: ⅜" = 1'–0"

LIST OF PILES			
LOCATION	NO.	SIZE	ESTIMATED LENGTH (FT)
SOUTH ABUTMENT	S2	HP 14 X 117	85±
	S1 & S3	HP 14 X 117	85±
CENTER PIER BENT	P2	HP 14 X 117	85±
	P1 & P3	HP 14 X 117	85±
NORTH ABUTMENT	N2	HP 14 X 117	85±
	N1 & N3	HP 14 X 117	85±

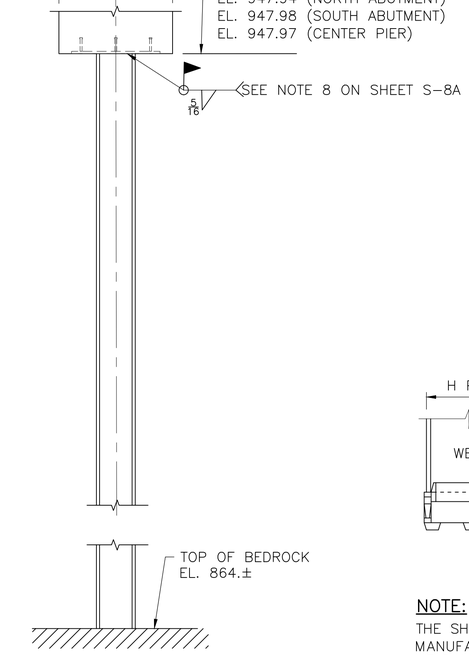
NOTES:

1. ESTIMATED PILE LENGTHS SHOWN IN THE TABLE ABOVE ARE BASED ON INFORMATION FROM BORINGS. FINAL PILE LENGTHS ARE EXPECTED TO VARY BASED ON DRIVING CONDITIONS AND THE RESULTS OF DYNAMIC PILE TESTING.
   HIGHEST ALLOWABLE TIP ELEVATION FOR DRIVEN ABUTMENT AND PIER PILES IS 50 FEET BELOW THE BOTTOM OF THE PILE CAPS:
   - SOUTH ABUTMENT: EL. 898.15
   - CENTER PIER: EL. 898.14
   - NORTH ABUTMENT: EL. 898.11

   DRIVEN PILES ARE ANTICIPATED TO BE DRIVEN DEEPER INTO THE GLACIAL OUTWASH OR GLACIAL TILL OR TO THE TOP OF BEDROCK TO DEVELOP THE REQUIRED ULTIMATE RESISTANCE.
2. ALL SPLICES SHALL HAVE COMPLETE PENETRATION BUTT WELDS. THERE SHALL BE NO SPLICES WITHIN THE TOP 30 FEET OF PILE. SPLICE WELDS SHALL BE 100% UTRASONIC TESTING.
3. THE AXIAL DESIGN LOAD PER PILE IS 260.0 KIPS AS PER AREMA SERVICE LOAD DESIGN GROUP I LOAD COMBINATION.
4. THE ALLOWABLE STRUCTURAL PILE RESISTANCE IS 509.8 KIPS.
5. HEAVY DUTY PILE SHOES SHALL BE INSTALLED ON THE TIPS OF ALL PILES. PREFABRICATED PILE SHOES MAY BE USED IF APPROVED BY THE ENGINEER.
6. DETERMINATION OF THE DRIVEN PILE RESISTANCE, PILE DRIVING CRITERIA, AND PILE INTEGRITY SHALL BE PERFORMED USING THE PILE DRIVING ANALYZER (PDA) WITH SIGNAL MATCHING. PILES SHALL BE INSTALLED TO ACHIEVE AN ULTIMATE DRIVEN RESISTANCE EQUAL TO OR GREATER THAN 2.25 TIMES THE MAXIMUM SERVICE AXIAL DESIGN LOAD. A MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER ENGAGED BY THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THE PDA TESTING IN ACCORDANCE WITH SECTION 940 OF THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, 2022 EDITION.
7. THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE DRIVING/TESTING PLAN FOR REVIEW AND APPROVAL OF THE ENGINEER.
8. PILE DRIVING TESTING SHALL BE PERFORMED BY CONTRACTOR ON A LEAST ONE ABUTMENT PILE ON EACH SIDE, ONE BATTERED PIER PILE, AND ONE VERTICAL PIER PILE FOR A TOTAL OF AT LEAST 4 PILES.
9. PILES SHALL BE DRIVEN IN ACCORDANCE WITH SECTION 940 OF THE MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGS, 2022 EDITION AND THE REQUIREMENTS SHOWN ON THE DRAWINGS. IN THE EVENT OF A CONFLICT, THE NOTES ON THE DRAWING GOVERN.
10. PILES SHALL CONFORM TO ASTM A572, GRADE 50.
11. PILES SHALL BE COATED WITH COAL TAR EPOXY COATING BEFORE DRIVING. THE COAL TAR EPOXY COATING SHALL EXTEND AT LEAST 15 FEET BELOW THE FINAL GRADE. TOUCH UP COAL TAR EPOXY AT TOP OF PILE AFTER WELDING.
12. SEE SHEET S–8A FOR DETAILS FOR MICROPILE OPTION.

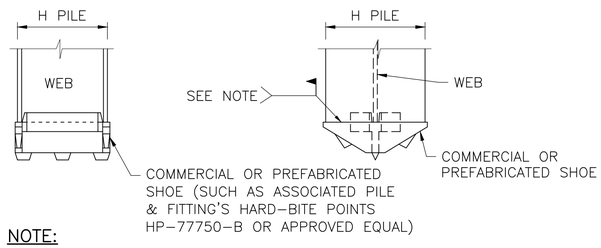
REQUIRED PILE LOCATION TOLERANCES:

1. CONFORMANCE TO THE FOLLOWING TOLERANCES IS OF EXTREME IMPORTANCE TO FOUNDATIONS OF THIS TYPE.
2. PRIOR TO DRIVING, EACH PILE SHALL BE HELD BY TEMPLATE TO WITHIN 1" OF PLAN LOCATION.
3. AFTER EACH PILE IS DRIVEN, THE TOP OF THE PILE SHALL BE WITHIN 3" OF PLAN LOCATION.



STEEL HP PILE DETAIL

SCALE: ½" = 1'–0"

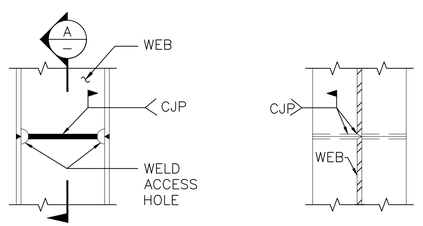


NOTE:

THE SHOE WELD JOINT DESIGN SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION AND AS SHOWN ON THE APPROVED WELDING PROCEDURE SPECIFICATIONS.

STEEL H–PILE SHOE

NOT TO SCALE



ELEVATION SECTION A

NOTES:

1. ALL WELDS SHALL BE COMPLETE PENETRATION AND SHALL CONFORM TO THE ANSI/AASHTO/AWS BRIDGE WELDING CODE, D1.5.
2. WELDING PROCEDURE SPECIFICATIONS MUST BE APPROVED BY THE ENGINEER PRIOR TO WELDING.
3. WHENEVER POSSIBLE ALL PILES SHALL BE SPLICED ON THE GROUND IN THE FLAT POSITION.
4. WEB SHALL BE COPED TO ALLOW FOR COMPLETE PENETRATION WELDING OF FLANGES.

H–PILE SPLICE DETAILS

NOT TO SCALE

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CONTRACT NO. 120593

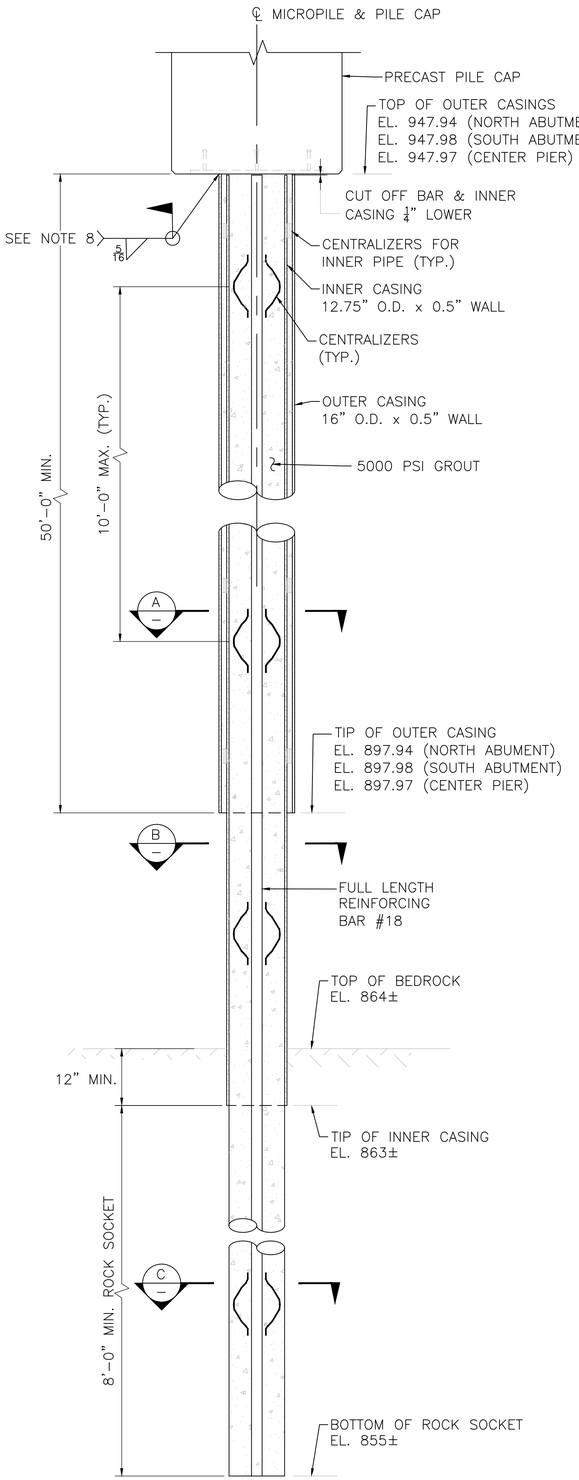
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
FOUNDATION LAYOUT DETAILS

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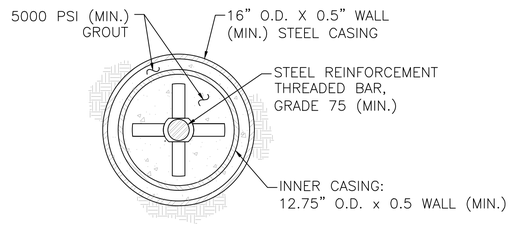
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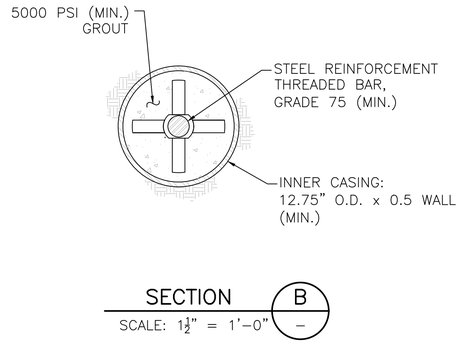
MICROPILE DETAILS

SCALE: ¾" = 1'-0"

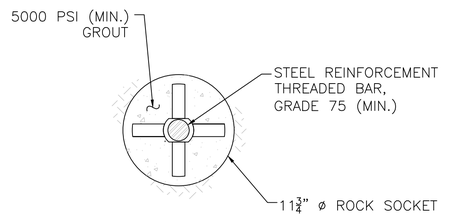


CENTRALIZER BETWEEN CASINGS NOT SHOWN FOR CLARITY.

SECTION A – SCALE: 1½" = 1'-0"



SECTION B – SCALE: 1½" = 1'-0"



SECTION C – SCALE: 1½" = 1'-0"

LIST OF MICROPILES			
LOCATION	NO.	INNER CASING SIZE	* ESTIMATED LENGTH (FT)
SOUTH ABUTMENT	S2	12.75"ø x ½"	93±
	S1 & S3	12.75"ø x ½"	
CENTER PIER BENT	P2	12.75"ø x ½"	
	P1 & P3	12.75"ø x ½"	
NORTH ABUTMENT	N2	12.75"ø x ½"	
	N1 & N3	12.75"ø x ½"	93±

* INCLUDING 8' ROCK SOCKET

MICROPILE NOTES:

1. GROUT SHALL BE A NEAT CEMENT GROUT WITH A MINIMUM 3-DAY UNCONFINED COMPRESSIVE STRENGTH OF 2,500 PSI AND A MINIMUM 28-DAY UNCONFINED COMPRESSIVE STRENGTH OF 5,000 PSI. THE GROUT SHALL CONFORM TO AASHTO T106/ASTM C109.
2. ALL PERMANENT STEEL OUTER PIPE CASINGS SHALL BE NEW PRIME STEEL MEETING THE REQUIREMENTS OF ASTM A252, GRADE 3. FOR INNER PIPE, CASINGS SHALL BE NEW PRIME STEEL MEETING THE REQUIREMENTS OF ASTM A252, GRADE 3, OR API 5L PSL1, GRADE 52 WITH SR15 SUPPLEMENTAL REQUIREMENTS.
3. NO THREADED OUTER CASING JOINTS SHALL BE LOCATED WITHIN 8 FEET OF THE PILE CAP. JOINTS IN INNER CASING SHALL BE STAGGERED AT 5'-0"±6" FROM JOINTS IN OUTER CASING.
4. THREADED BARS SHALL BE ASTM A615, GRADE 75, AND SHALL BE JOINED WITH COUPLERS SUPPLIED BY THE MANUFACTURER. THE COUPLERS SHALL BE CAPABLE OF DEVELOPING OR EXCEEDING THE STRENGTH OF THE THREAD BAR.
5. THE CONTRACTOR SHALL SUBMIT A PILE SCHEDULE, PILE INSTALLATION, AND PILE TESTING PLAN FOR REVIEW AND APPROVAL BY THE ENGINEER.
6. MICROPILES SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH SPECIAL PROVISIONS ITEM 945.10 DRILLED MICROPILES.
7. THE AXIAL DESIGN LOAD PER PILE FOR ABUTMENT AND PIER PILES IS 260.0 KIPS AS PER AREMA SERVICE LOAD DESIGN GROUP I LOAD COMBINATION.
8. THE CONTRACTOR SHALL SUBMIT WELDING PROCEDURE AS A PART OF SUPERSTRUCTURE ERECTION PROCEDURE FOR ENGINEER'S REVIEW. THE WELDING PROCEDURE SHOULD COVER POSSIBLE FIELD CONDITIONS SUCH AS THE TOP OF PILES MAY BE CUT OFF LOWER THAN ELEVATIONS INDICATED ON PLANS. MEASUREMENTS FOR CONTROL OF HEAT GENERATED DURING WELDING TO AVOID DAMAGING SURROUNDING PRECAST CONCRETE DUE TO THERMAL EXPANSION IN EMBEDDED STEEL PLATES SHALL BE INCLUDED IN THE PROCEDURE.

REQUIRED PILE LOCATION TORERANCES:

1. CONFORMANCE TO THE FOLLOWING TOLERANCES IS OF EXTREME IMPORTANCE TO FOUNDATIONS OF THIS TYPE.
2. PRIOR TO DRILLING, EACH PILE SHALL BE HELD BY TEMPLATE TO WITHIN 1" OF PLAN LOCATION.
3. AFTER EACH PILE IS INSTALLED, THE TOP OF THE PILE SHALL BE WITHIN 2" OF PLAN LOCATION.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

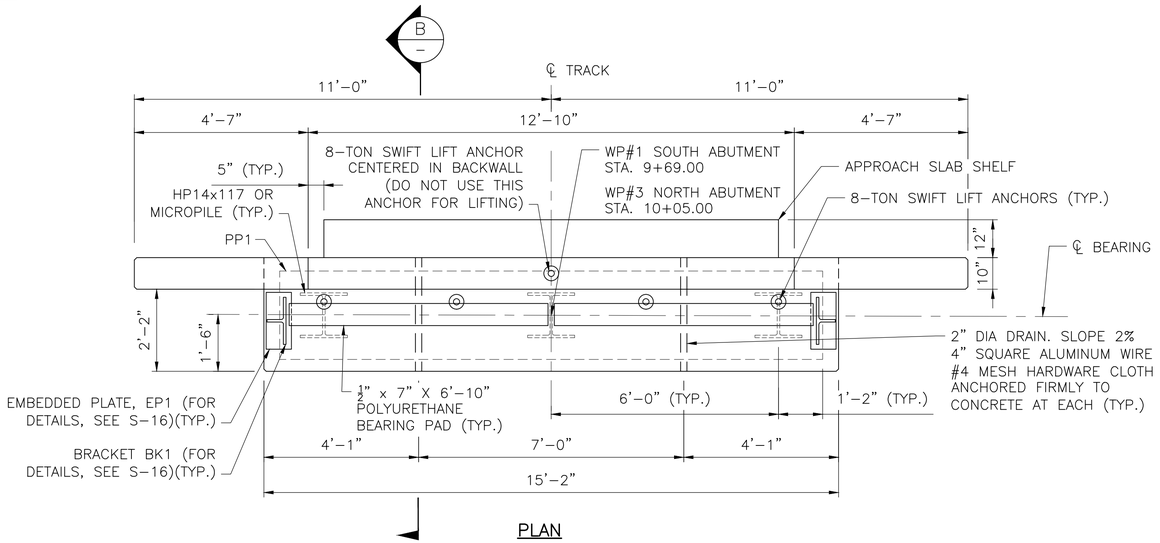
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
DETAILS FOR MICROPILE OPTION

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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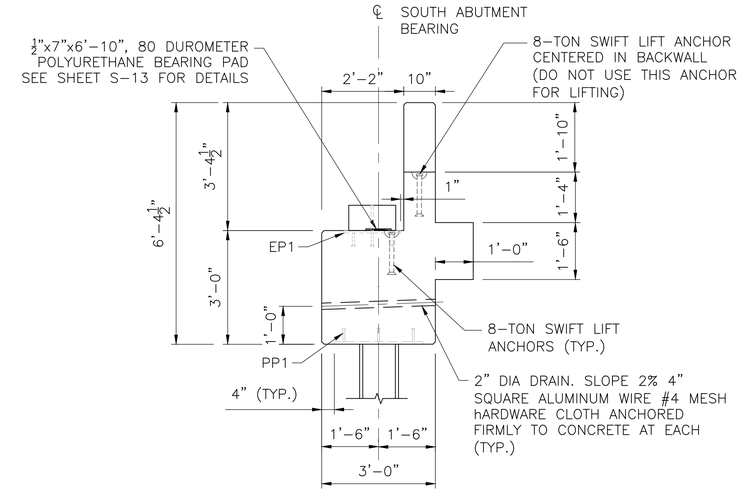
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PLAN

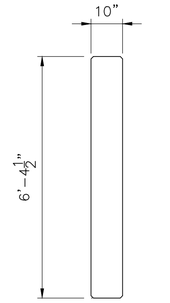
SCALE: ½" = 1'–0"

(SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR)
(FOR ORIENTATION SEE PROPOSED BRIDGE PLAN & ELEVATION SHEET)



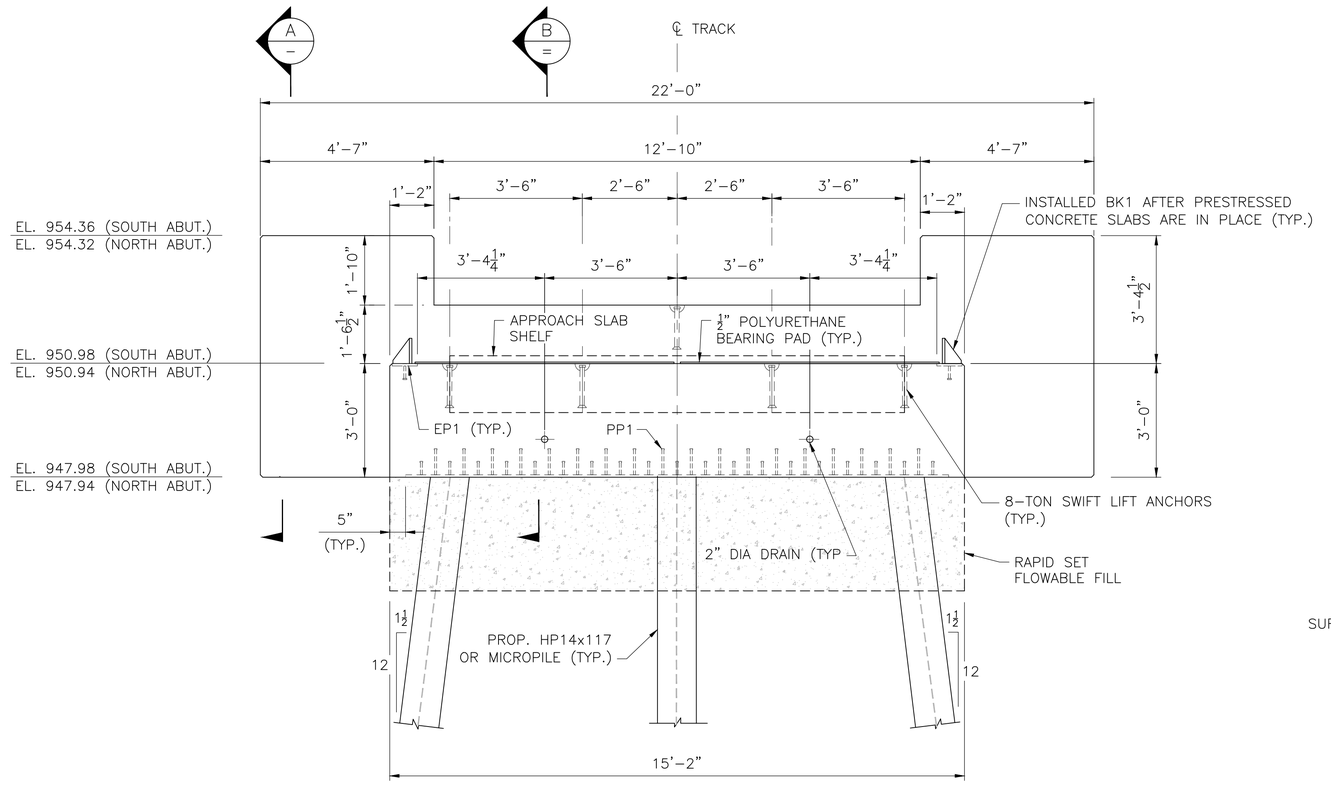
SECTION B

SCALE: ½" = 1'–0"



SECTION A

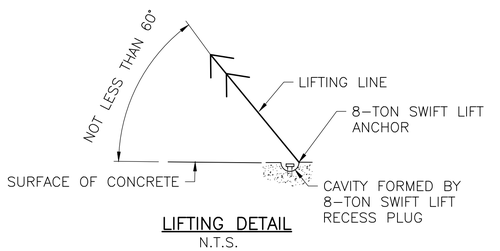
SCALE: ½" = 1'–0"



ELEVATION

SCALE: ½" = 1'–0"

(SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR)
(FOR ORIENTATION SEE PROPOSED BRIDGE PLAN & ELEVATION SHEET)



LIFTING DETAIL

N.T.S.

NOTES:

1. FOR GENERAL NOTES SEE SHEET S–1
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH S–8, S–11 AND S–16.
3. MICROPILE OPTION NOT SHOWN FOR CLARITY.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

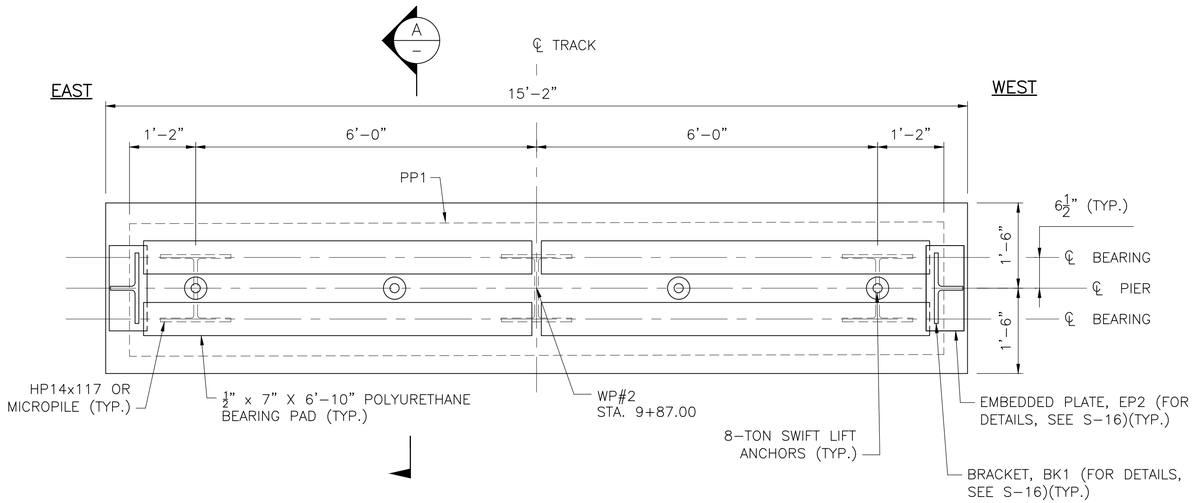
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
ABUTMENT LAYOUT DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

massDOT Massachusetts Department of Transportation Rail & Transit Division

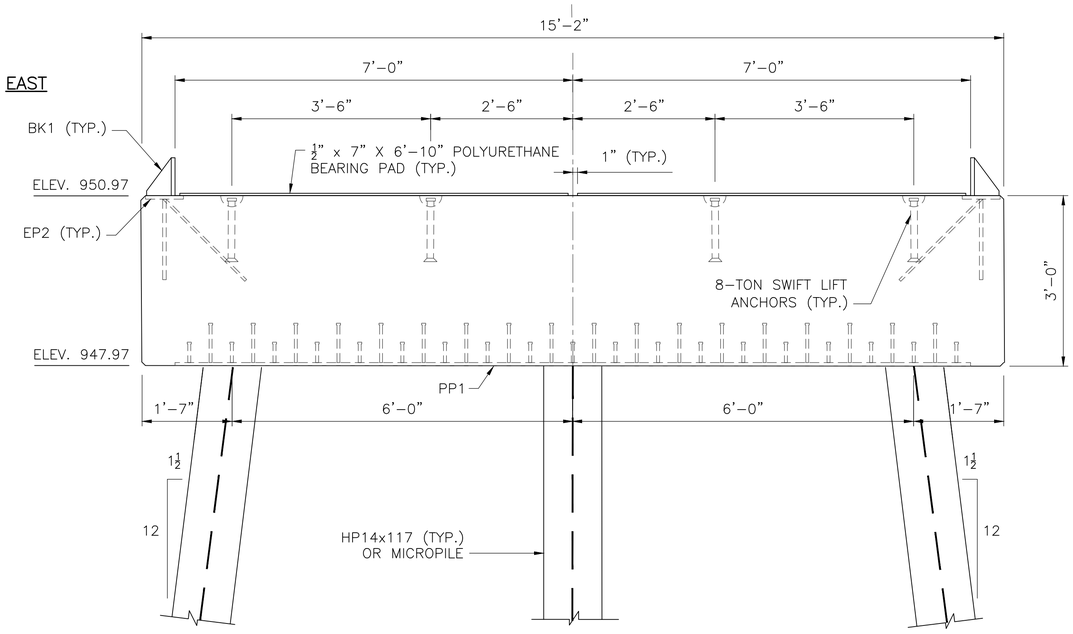
SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	A.T.	E.Y.	SSL	SHEET: S–9	



PLAN

SCALE: ¾" = 1'–0"

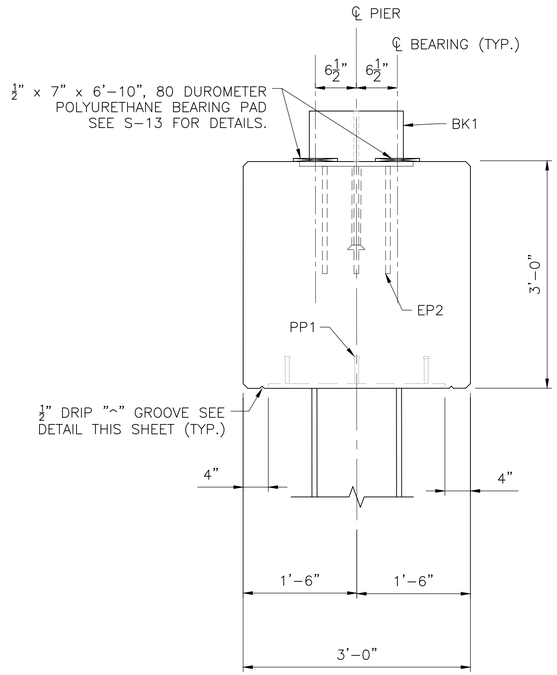
(FOR ORIENTATION SEE PROPOSED BRIDGE PLAN & ELEVATION SHEET)



ELEVATION

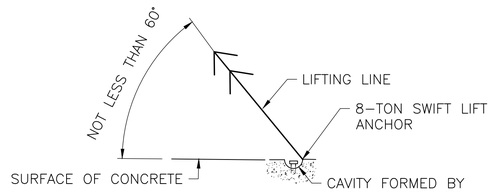
SCALE: ¾" = 1'–0"

(FOR ORIENTATION SEE PROPOSED BRIDGE PLAN & ELEVATION SHEET)



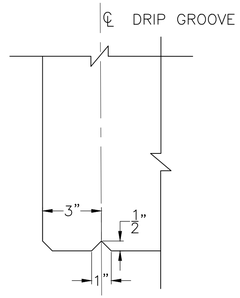
SECTION A

SCALE: 1" = 1'–0"



LIFTING DETAIL

N.T.S.



DRIP GROOVE DETAIL

SCALE: N.T.S.

(REINFORCING NOT SHOWN FOR CLARITY)

NOTES:

1. FOR GENERAL NOTES SEE SHEET S–1.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH S–8, S–12 AND S–16.
3. MICROPILE OPTION NOT SHOWN FOR CLARITY.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

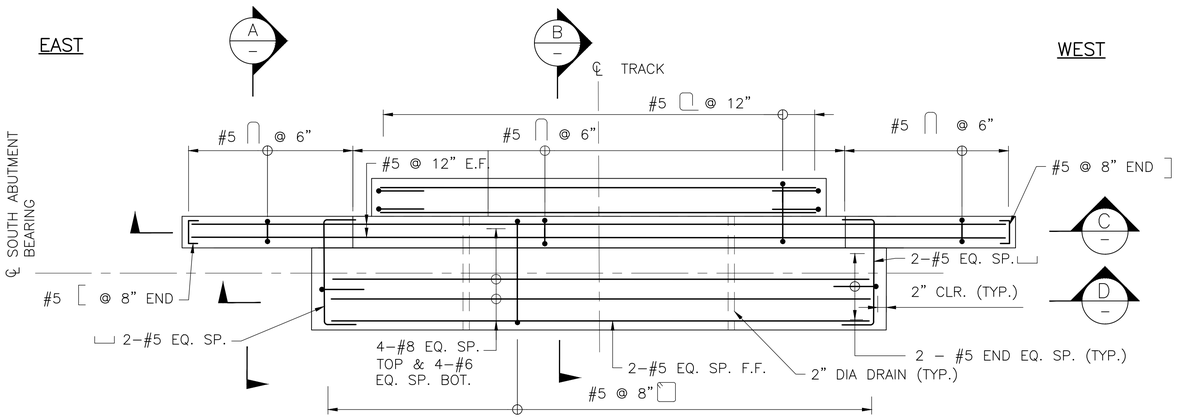
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PIER LAYOUT DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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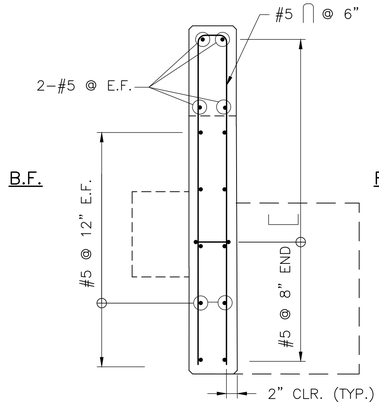
SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	M.V.	E.Y.	SSL	SHEET: S–10	



SOUTH ABUTMENT REINFORCING PLAN

SCALE: $\frac{1}{2}$" = 1'–0"

(SOUTH ABUTMENT SHOWN, NORTH ABUTMENT SIMILAR)

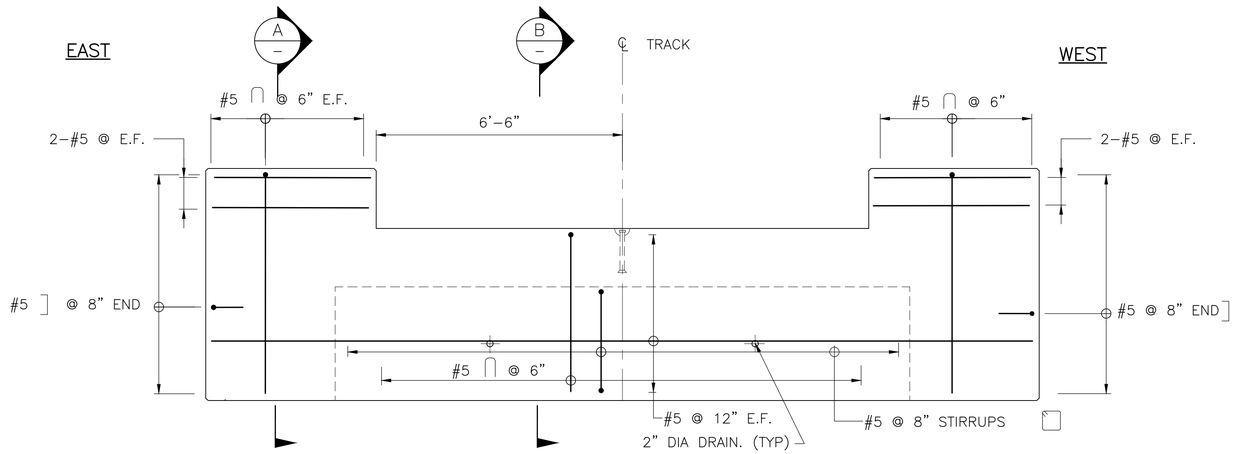


SECTION A

SCALE: $\frac{3}{4}$" = 1'–0"

LEGEND:

F.F.	DENOTES	FRONT FACE
B.F.	DENOTES	BACK FACE
E.F.	DENOTES	EACH FACE
TYP.	DENOTES	TYPICAL
BOT.	DENOTES	BOTTTOM
EQ. SP.	DENOTES	EQUALLY SPACED
R/F	DENOTES	REINFORCEMENT



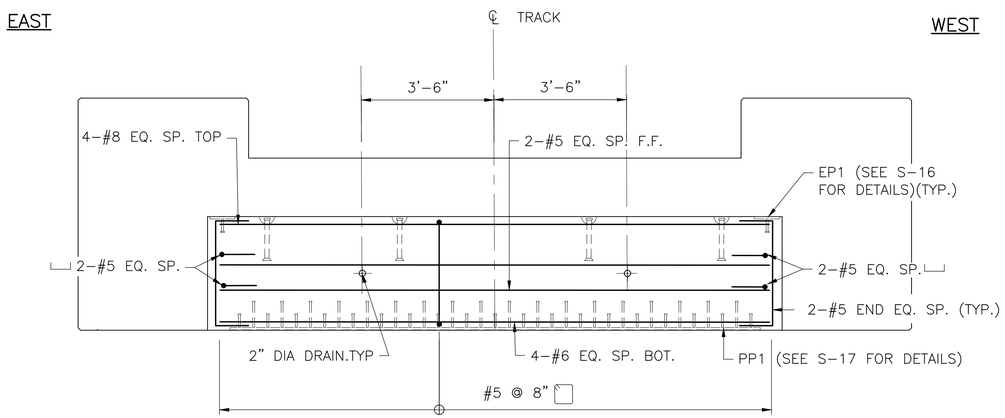
SECTION C–C – BACKWALL REINFORCING

SCALE: $\frac{1}{2}$" = 1'–0"

(SOUTH ABUTMENT R/F SHOWN, NORTH ABUTMENT R/F SIMILAR)

SECTION B

SCALE: $\frac{3}{4}$" = 1'–0"



SECTION D–D – BRIDGE SEAT REINFORCING

SCALE: $\frac{1}{2}$" = 1'–0"

(SOUTH ABUTMENT R/F SHOWN, NORTH ABUTMENT R/F SIMILAR)

NOTES:

1. FOR GENERAL NOTES SEE SHEET S–1.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH S–9 AND S–16.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

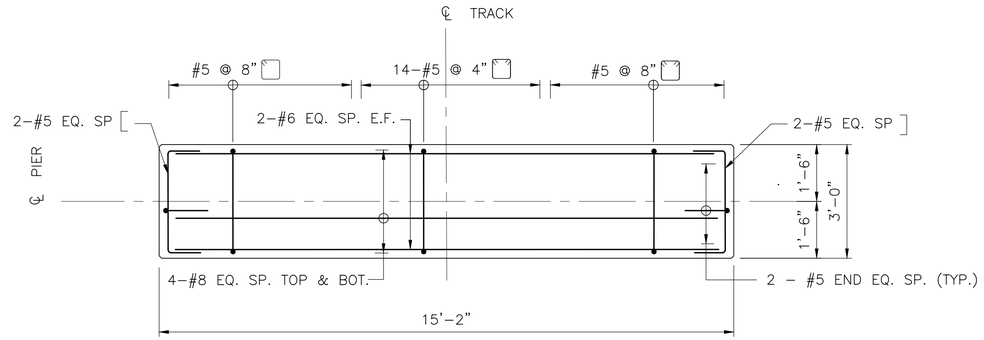
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
ABUTMENT CAP REINFORCEMENT DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

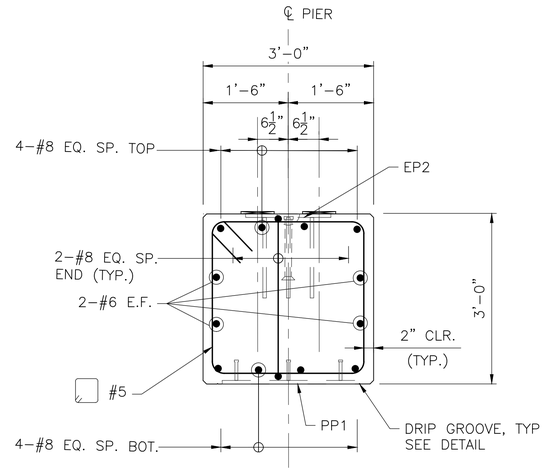
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BOSTON, MA 02110
(617) 357-7700

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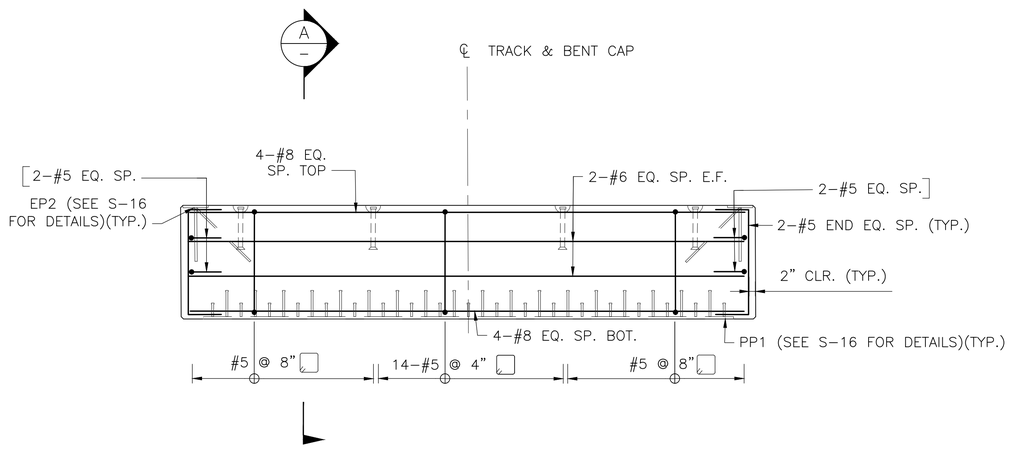
SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	M.V.	E.Y.	SSL	SHEET: S–11	



PRECAST CAP PLAN
SCALE: $\frac{1}{2}$" = 1'–0"



SECTION A
SCALE: $\frac{3}{4}$" = 1'–0"



PRECAST CAP ELEVATION
SCALE: $\frac{1}{2}$" = 1'–0"

NOTES:

1. FOR GENERAL NOTES SEE SHEET S–1.

LEGEND:

F.F.	DENOTES	FRONT FACE
B.F.	DENOTES	BACK FACE
E.F.	DENOTES	EACH FACE
TYP.	DENOTES	TYPICAL
BOT.	DENOTES	BOTTTOM
EQ. SP.	DENOTES	EQUALLY SPACED
R/F	DENOTES	REINFORCEMENT

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

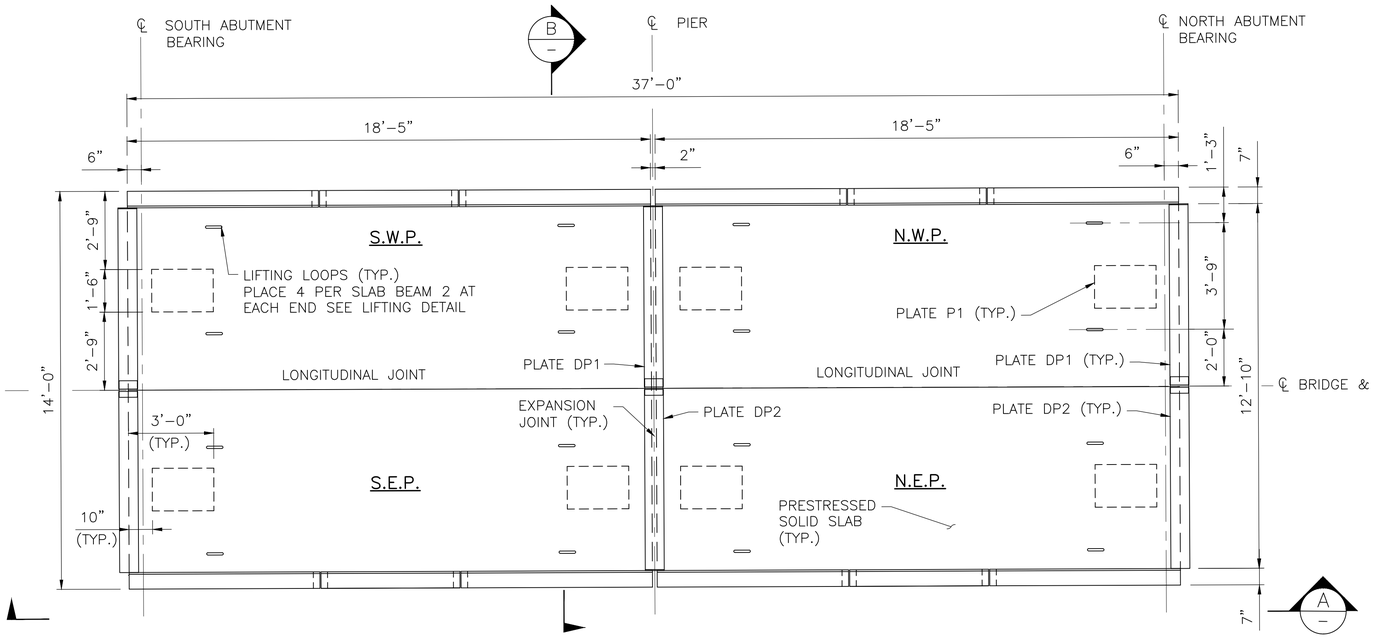
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PIER CAP REINFORCEMENT DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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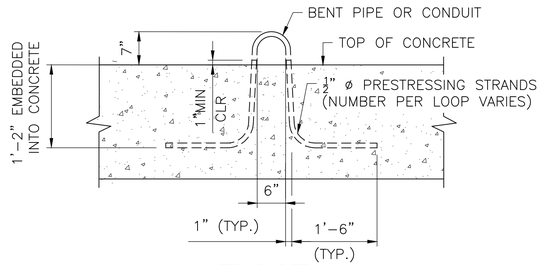
massDOT Massachusetts Department of Transportation Rail & Transit Division

SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	A.T.	E.Y.	SSL	SHEET: S–12	



PRESTRESSED CONCRETE SLAB PLAN

SCALE: ⅜" = 1'–0"



LIFTING DETAIL

SCALE: N.T.S.

NOTES:

1. FOR GENERAL NOTES SEE SHEET S–1.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH S–14.

LEGEND:

S.W.P.	DENOTES	SOUTH WEST PANEL
S.E.P.	DENOTES	SOUTH EAST PANEL
N.W.P.	DENOTES	NORTH WEST PANEL
N.E.P.	DENOTES	NORTH EAST PANEL

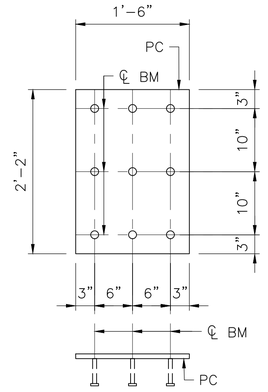
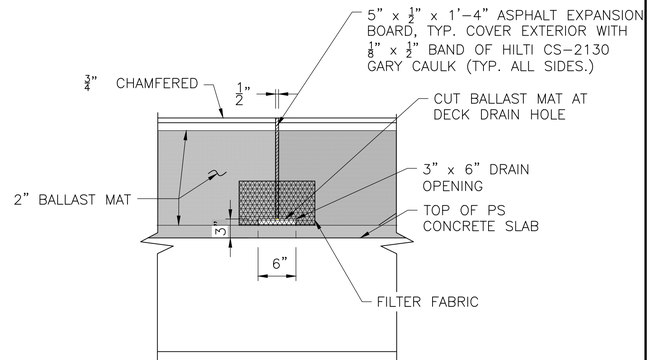


PLATE P1

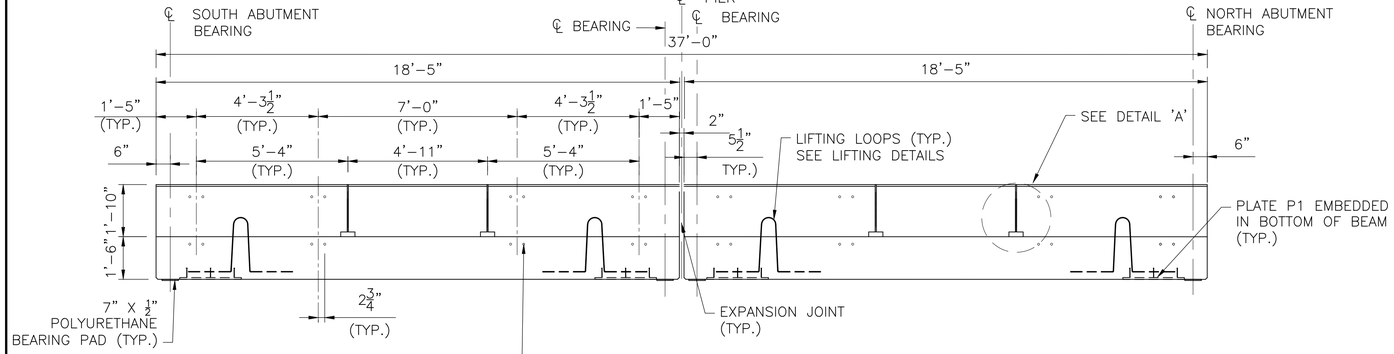
SCALE: N.T.S.

1 ~ PLATE ¾"X18"X2'–2" – PC
9 ~ ⅞" DIA X 4" SHEAR STUD – BM



DETAIL 'A'

SCALE: 1" = 1'–0"



SECTION A

SCALE: ⅜" = 1'–0"

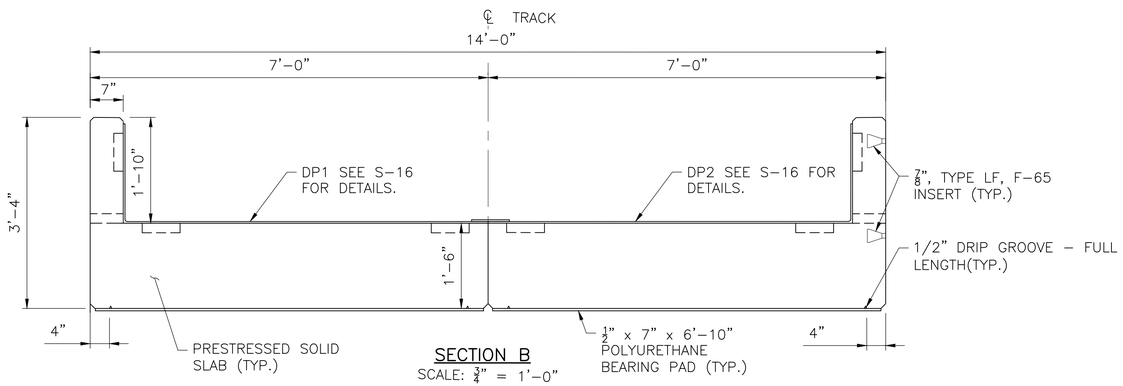
(SOUTH WEST AND NORTH WEST PANEL SHOWN, SOUTH EAST AND NORTH EAST PANEL MIRRORED.)

NOTE:

1. THE BEARING PAD SHALL BE IN ACCORDANCE WITH THE LATEST AREMA MANUAL WITH THE FOLLOWING CHARACTERISTICS/CONSTRAINTS:
   - 80 DUROMETER POLYURETHANE WITH A MINIMUM SHEAR MODULUS OF 500 PSI AND MAXIMUM SHEAR MODULUS OF 1,450 PSI.
   - AVERAGE COMPRESSIVE STRESS OF 1,000 PSI.

BEARING PAD PLAN

SCALE: N.T.S.



SECTION B

SCALE: ¾" = 1'–0"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

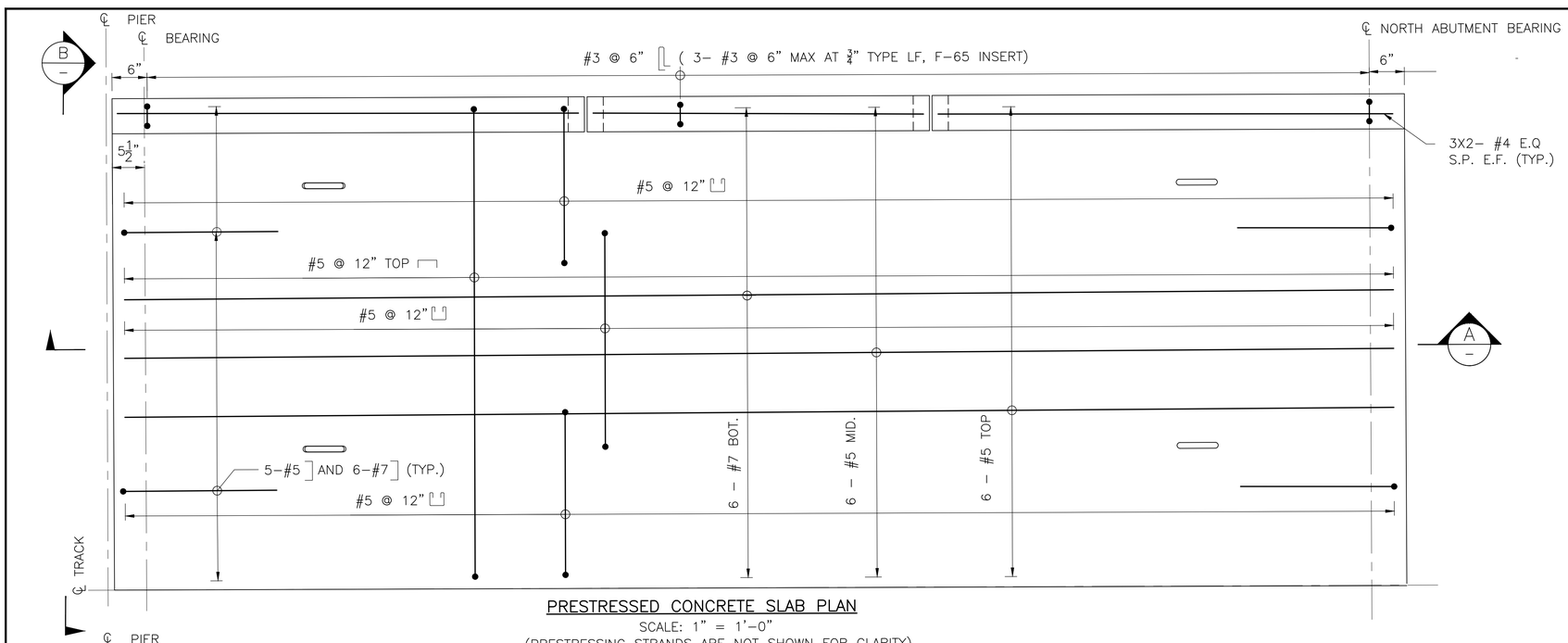
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PRESTRESSED CONCRETE SLAB
LAYOUT DETAILS

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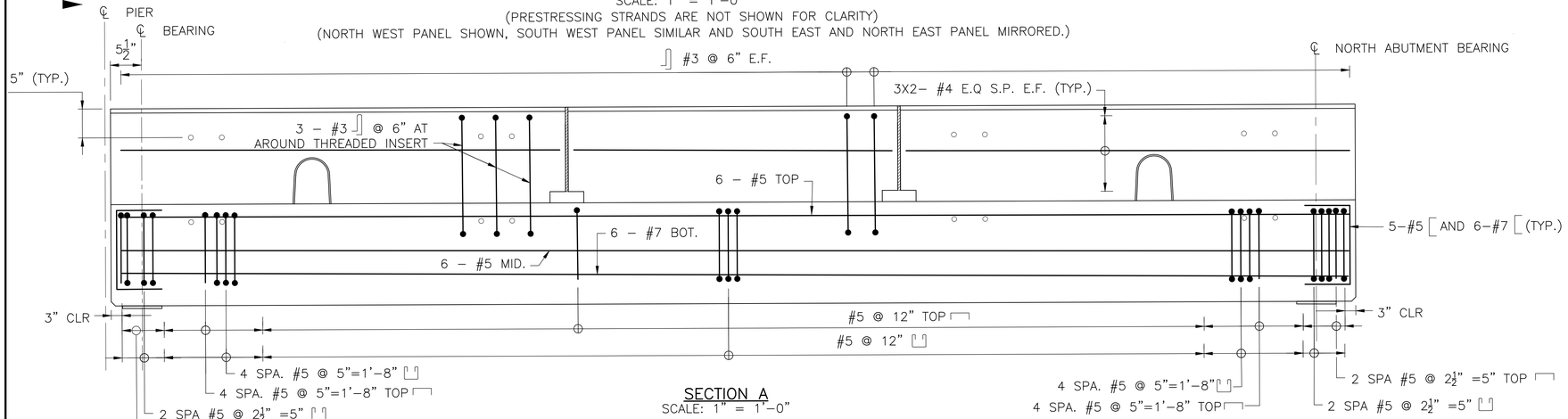


PRESTRESSED CONCRETE SLAB PLAN

SCALE: 1" = 1'–0"

(PRESTRESSING STRANDS ARE NOT SHOWN FOR CLARITY)

(NORTH WEST PANEL SHOWN, SOUTH WEST PANEL SIMILAR AND SOUTH EAST AND NORTH EAST PANEL MIRRORED.)

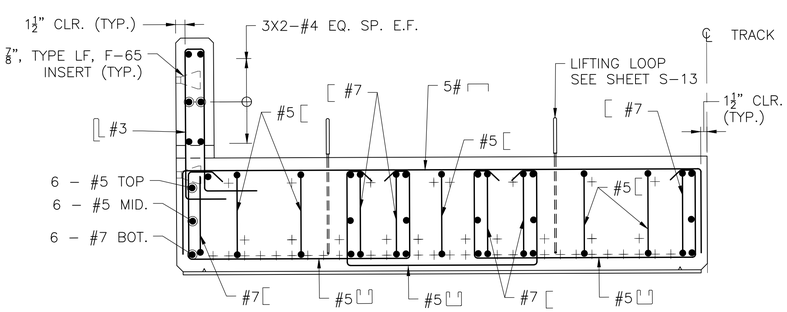


SECTION A

SCALE: 1" = 1'–0"

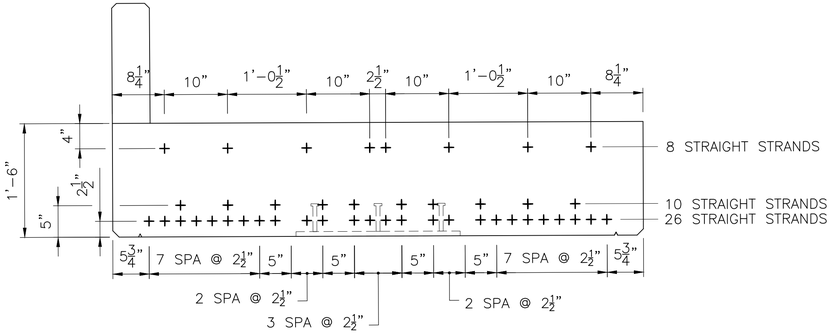
(PRESTRESSING STRANDS ARE NOT SHOWN FOR CLARITY)

(NORTH WEST PANEL SHOWN, SOUTH WEST PANEL SIMILAR AND SOUTH EAST AND NORTH EAST PANEL MIRRORED.)



SECTION B

SCALE: 1" = 1'–0"



SECTION B

SCALE: 1" = 1'–0"

NOTES:

1. FOR GENERAL NOTES SEE SHEET S–1.

LEGEND:

F.F.	DENOTES	FRONT FACE
B.F.	DENOTES	BACK FACE
E.F.	DENOTES	EACH FACE
MID.	DENOTES	MIDDLE LAYER
TYP.	DENOTES	TYPICAL
BOT.	DENOTES	BOTTOM
EQ.SP.	DENOTES	EQUALLY SPACED

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

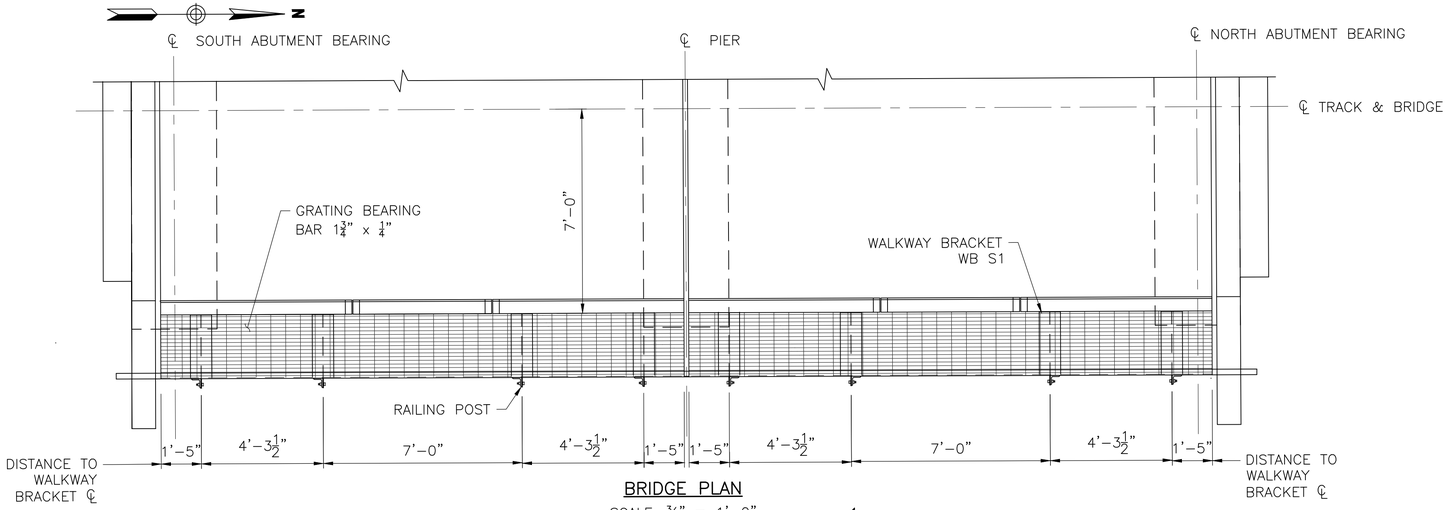
MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PRESTRESSED CONCRETE SLAB
REINFORCEMENT DETAILS

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BOSTON, MA 02110
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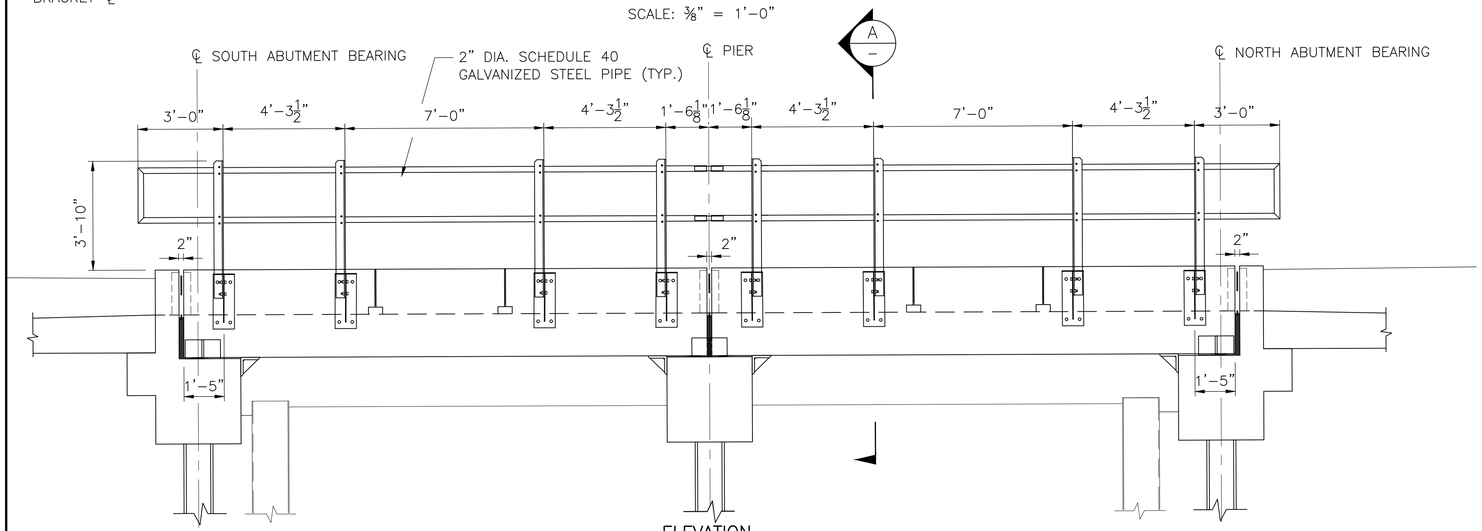
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Rail & Transit Division

SCALE: AS NOTED	DRAWN BY	DESIGN BY	CHECK BY	PLAN NO.	ISSUE
DATE: 12/12/2022	M.V.	E.Y.	SSL	SHEET: S–14	



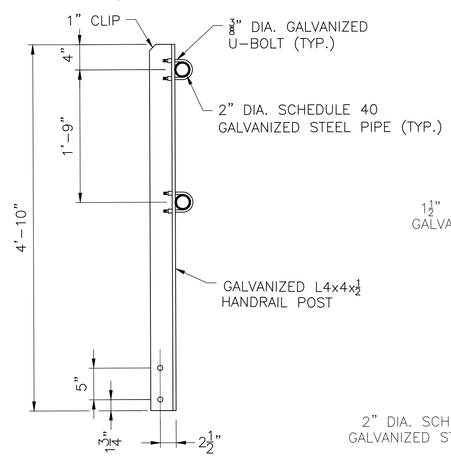
BRIDGE PLAN

SCALE: ⅜" = 1'–0"



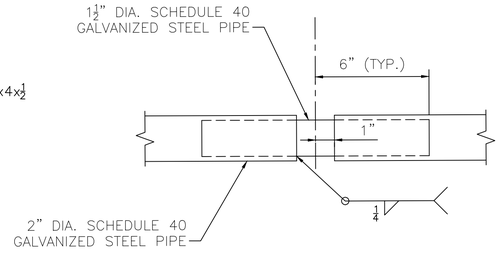
ELEVATION

SCALE: ⅜" = 1'–0"



DETAIL 1

SCALE: 1" = 1'–0"



RAIL SPLICE DETAIL AT PIER

SCALE: 1" = 1'–0"

GENERAL NOTES:

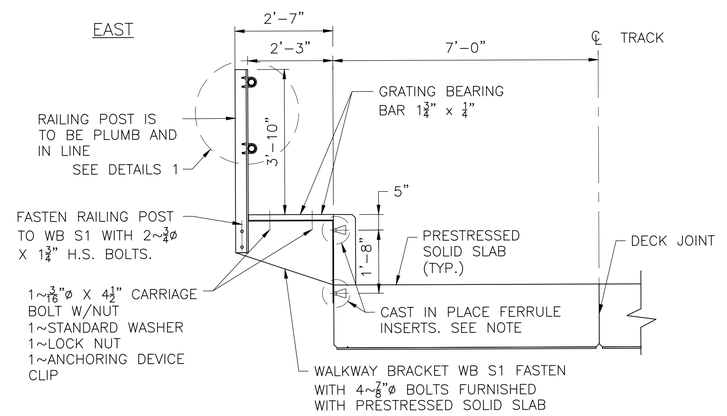
1. MATERIAL: STRUCTURAL STEEL PLATES AND BARS SHALL MEET THE REQUIREMENTS OF THE CURRENT ASTM A709 GRADE 36.
2. ALL BOLTS SHALL MEET THE REQUIREMENT OF ASTM F3125, GRADE A325.

FABRICATION NOTES:

1. SHOP NOTES: FABRICATION AND ARC WELDING OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH CHAPTER 15. PART 3 OF THE CURRENT A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING.
2. GALVANIZING: WB S1 BRACKETS, HANDRAIL POSTS AND HAND RAILS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE CURRENT A.S.T.M. DESIGNATION: A123.
3. AFTER GALVANIZING ALL ELEMENTS SHALL BE FREE OF FINS, ABRASIONS, ROUGH OR SHARP EDGES AND OTHER SURFACE DEFECTS.

NOTES:

1. FOR GENERAL NOTES, SEE SHEET S–1.

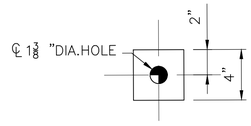


SECTION A

SCALE: ½" = 1'–0"

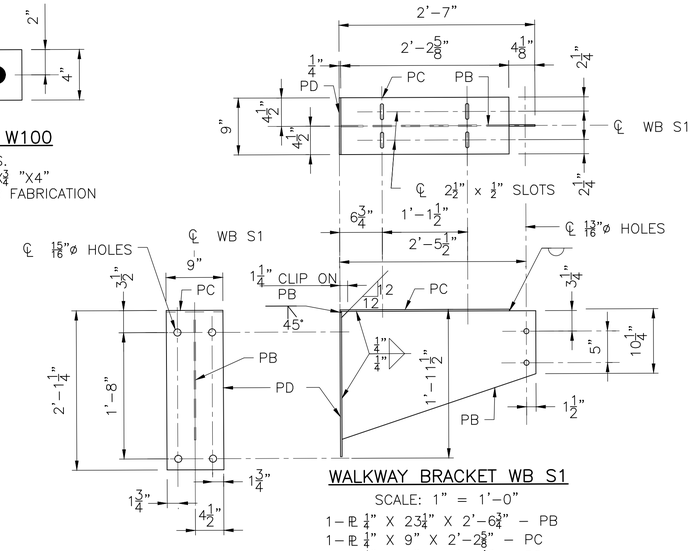
NOTE:

CAST IN PLACE FERRULE INSERTS TYPE LF X ⅞"ø AS MANUFACTURED BY DAYTON/RICHMOND SCREW ANCHOR CO. OR EQUAL. MINIMUM SHEAR = 3,000 LBS. MINIMUM TENSION = 3,660 LBS. 4 INSERTS PER WALKWAY BRACKET LOCATION. FURNISH WITH ⅞"ø BOLTS AND WASHERS. ALL ITEMS SHALL BE GALVANIZED.



WASHER W100

N.T.S.
1–BAR 4"X¾ "X4"
GALVANIZE AFTER FABRICATION



WALKWAY BRACKET WB S1

SCALE: 1" = 1'–0"

1–PL ¼" X 2¾" X 2'–6¾" – PB
1–PL ¼" X 9" X 2'–2⅝" – PC
1–PL ¼" X 9" X 2'–1¼" – PD

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

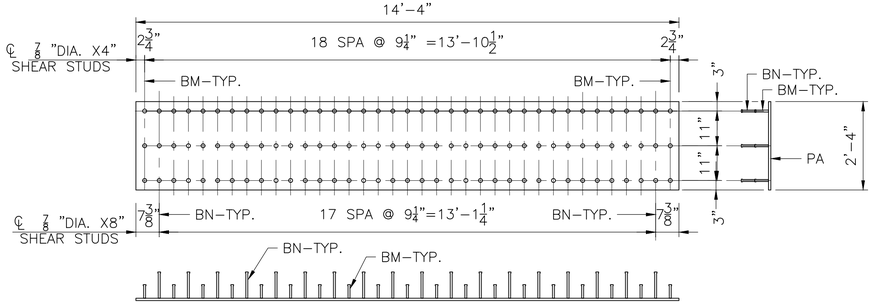
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
WALKWAY LAYOUT & DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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BOSTON, MA 02110
(617) 357-7700

massDOT Massachusetts Department of Transportation Rail & Transit Division

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DATE: 12/12/2022	SSL	SSL	JQW	SHEET: S–15	



PILE PLATE PP1

SCALE: ½" = 1'-0"

1~PL ¾"X28"X14'-4"-PA

57~ ⅞" DIA X 4" SHEAR STUDS-BM

54~ ⅞" DIA X 8" SHEAR STUDS-BN

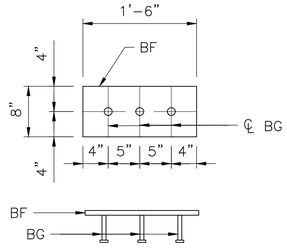


PLATE EP1

SCALE: N.T.S.

1~BAR 8"X¾"X1'-6"-BF

3~ ⅞" DIA X 4" STUDS-BG

GENERAL NOTES:

1. MATERIAL: STRUCTURAL STEEL PLATES AND BARS SHALL MEET THE REQUIREMENTS OF THE CURRENT A.S.T.M. DESIGNATION: A709. GRADE 36.
2. ALL STEEL PILE PLATES (PP1) SHALL MEET THE REQUIREMENTS OF THE CURRENT A.S.T.M. DESIGNATION: A709. GRADE 50.
3. SHEAR CONNECTOR STUDS SHALL MEET THE REQUIREMENTS OF SECTION 7 OF THE CURRENT A.W.S. STRUCTURAL WELDING CODE D1.1 FOR GRADE 1020 SOLID FLUX FILLED HEADED STUDS.

FABRICATION NOTES:

1. SHOP NOTES: FABRICATION AND ARC WELDING OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH CHAPTER 15, PART 3 OF THE CURRENT A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING. OPEN HOLES: AS NOTED. SHOP PAINT: NONE.
2. SHEAR CONNECTOR STUDS SHALL BE AUTOMATICALLY END WELDED WITH COMPLETE FUSION IN ACCORDANCE WITH SECTION 7 OF THE CURRENT A.W.S. STRUCTURAL WELDING CODE D1.1.
3. DECK PLATE DP1 AND DP2 SHALL BE GALVANISED AFTER FABRICATION IN ACCORDANCE WITH THE CURRENT A.S.T.M. DESIGNATION: A123
4. AFTER GALVANIZING ALL ELEMENTS SHALL BE FREE OF FINS, ABRASIONS, ROUGH OR SHARP EDGES AND OTHER SURFACE DEFECTS.

NOTES:

1. FOR GENERAL NOTES, SEE SHEET S-1
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH S-6, S-7, S-8, S-9, S-10, S-11 AND S-12.

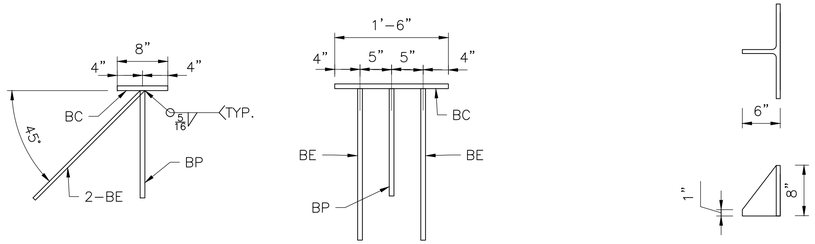


PLATE EP2

SCALE: N.T.S.

1~BAR 8"X¾"X1'-6"-BC

2~BARS #6 X 2'-0" -BE

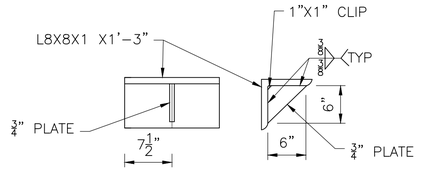
1~BARS #6 X 1'-5" -BP

BRACKET BK1

SCALE: N.T.S.

CONTRCTOR TO FABRICATE FROM HP14X117

GALVANIZED AFTER FRABRICATION

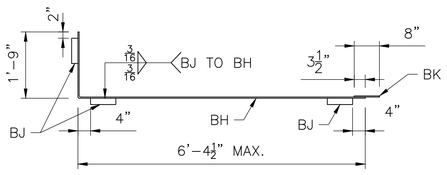


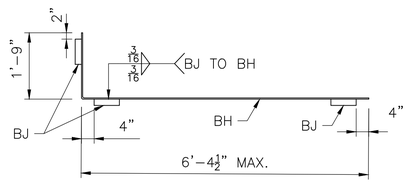
LONGITUDINAL RESTRAINT BRACKET MK LRB1

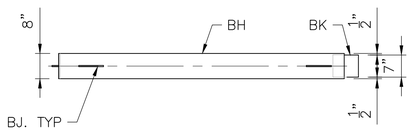
SCALE: N.T.S.

1~ L8X8X1 X1'-3"

1~PL ¾ "X6" X0'-6"







DECK PLATE DP1

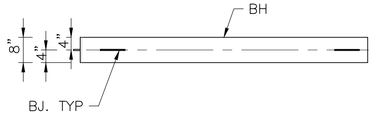
SCALE: ½" = 1'-0"

1~PL ⅜" x 8" x 8'-1½" (BENT) - BH

3~BARS 2" x ⅜" x 8" - BJ

1~BAR 7" x ⅜" x 8" - BK

GALVANIZED AFTER FABRICATION



DECK PLATE DP2

SCALE: ½" = 1'-0"

1~PL ⅜" x 8" x 8'-1½" (BENT) - BH

3~BARS 2" x ⅜" x 8" - BJ

GALVANIZED AFTER FABRICATION

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

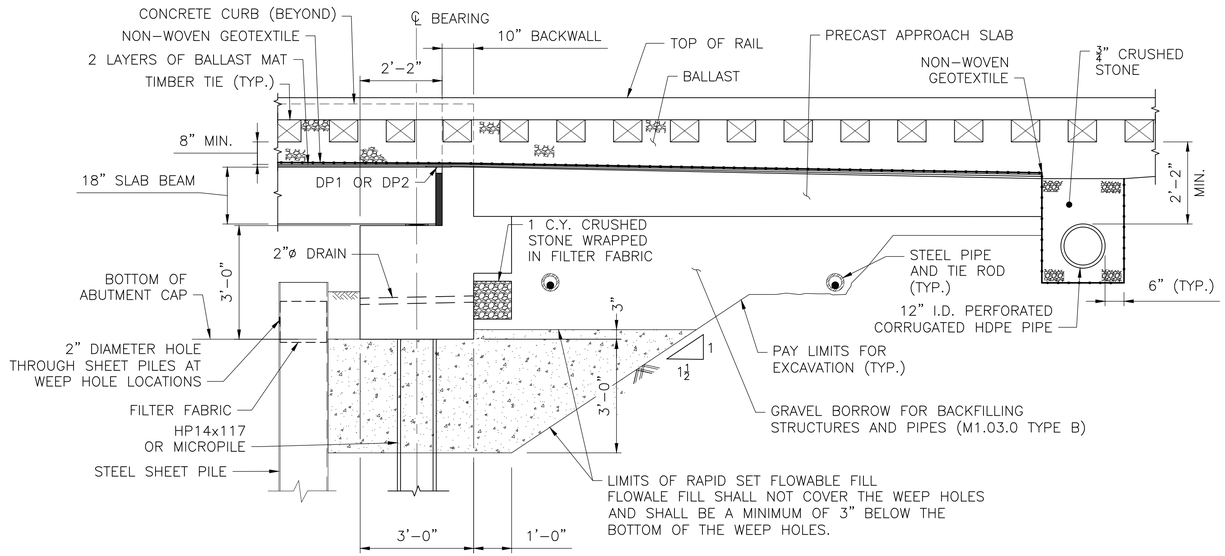
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
STEEL DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

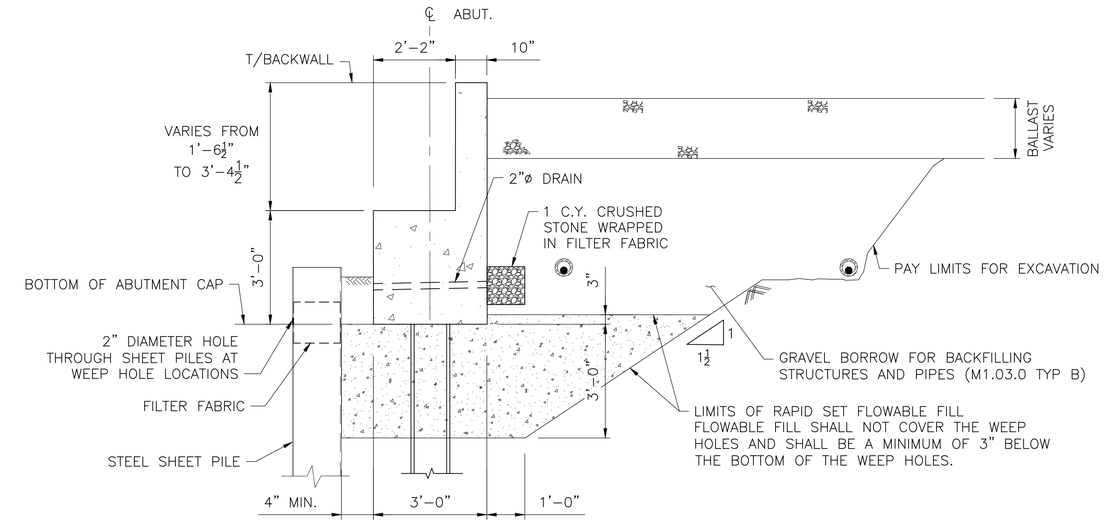
massDOT Massachusetts Department of Transportation Rail & Transit Division

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TYPICAL ABUTMENT SECTION AT TRACK

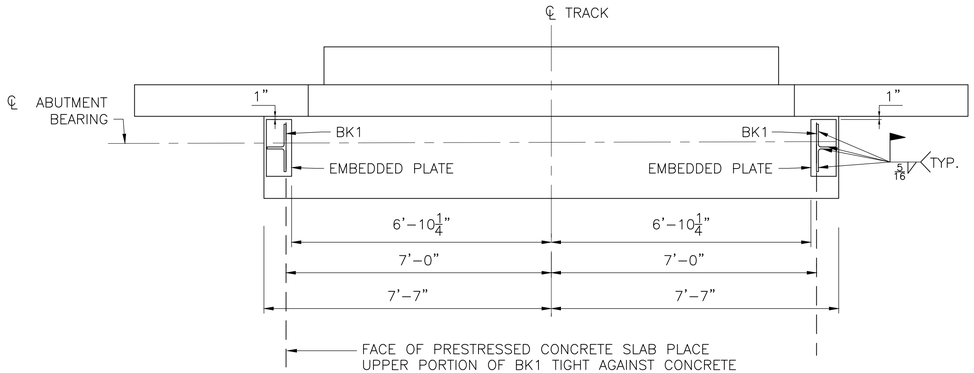
SCALE: ½" = 1'–0"



TYPICAL ABUTMENT SECTION OUTSIDE OF TRACK

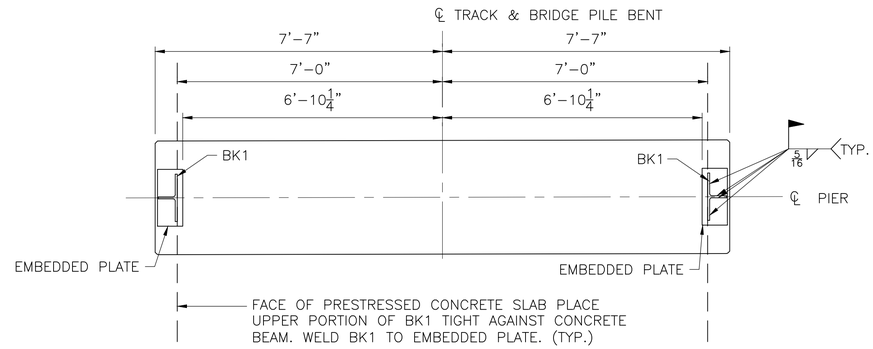
SCALE: ½" = 1'–0"

BEFORE BACKFILLING END BENTS, APPLY A COATING OF PETROLATUM TO PILE PLATE PP1, AND TOP ONE FOOT OF PILES



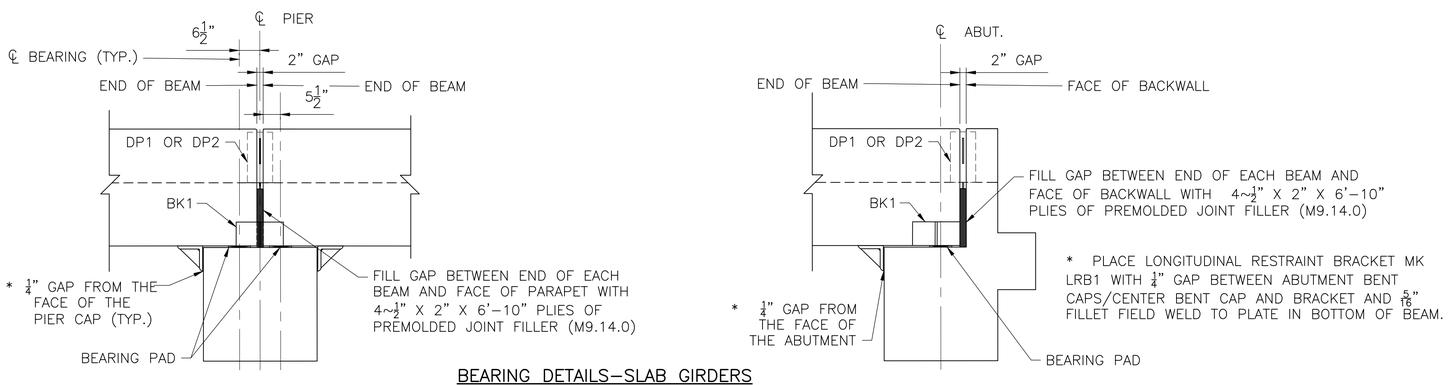
WELDING OF LATERAL RESTRAINT BK1 ABUTMENT

SCALE: ½" = 1'–0"



WELDING OF LATERAL RESTRAINT BK1 PIER CAP

SCALE: ½" = 1'–0"



BEARING DETAILS–SLAB GIRDERS

SCALE: ½" = 1'–0"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

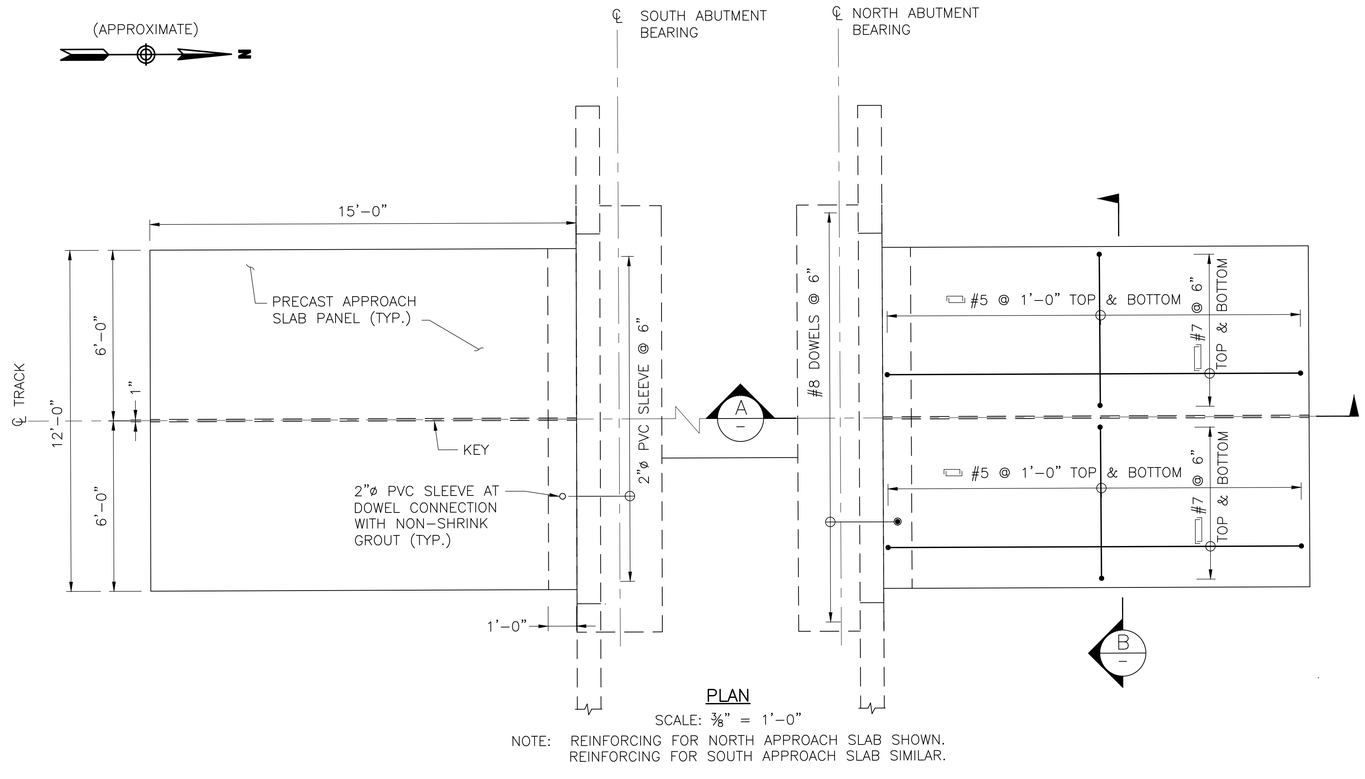
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
MISCELLANEOUS DETAILS

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MassDOT Rail & Transit Division

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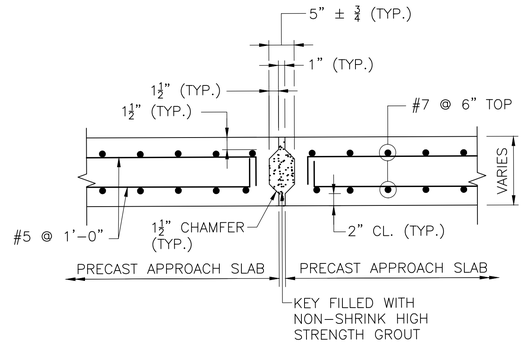
PLAN

SCALE: ⅜" = 1'–0"

NOTE: REINFORCING FOR NORTH APPROACH SLAB SHOWN. REINFORCING FOR SOUTH APPROACH SLAB SIMILAR.

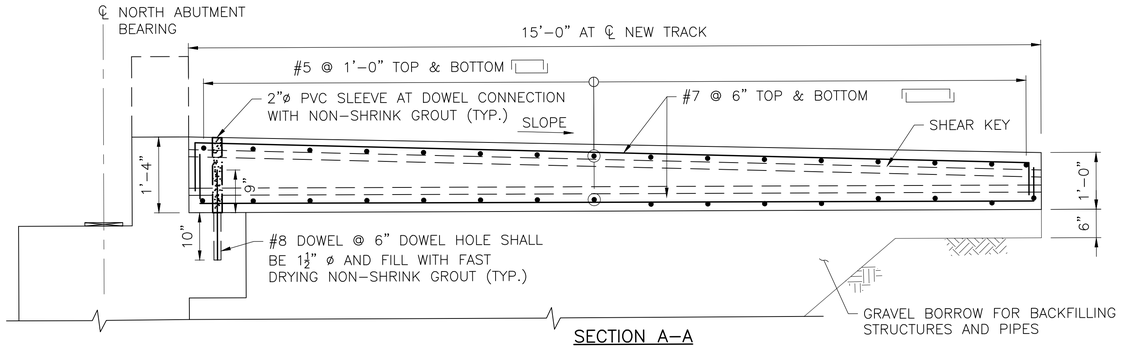
NOTES:

1. FOR GENERAL NOTES SEE DWG. S–1
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH S–6



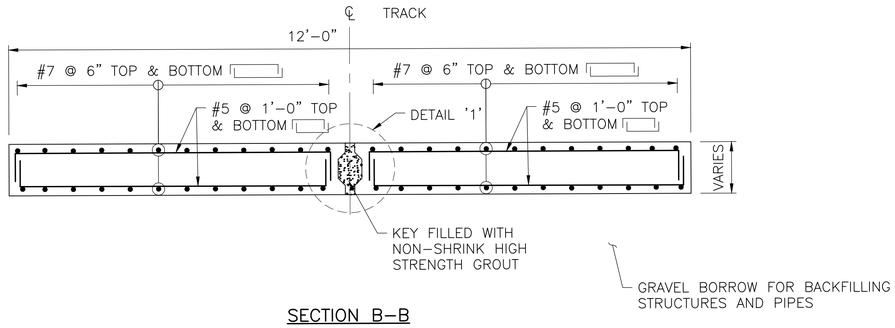
DETAIL '1'

SCALE: 1" = 1'–0"



SECTION A–A

SCALE: ¾" = 1'–0"



SECTION B–B

SCALE: ¾" = 1'–0"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

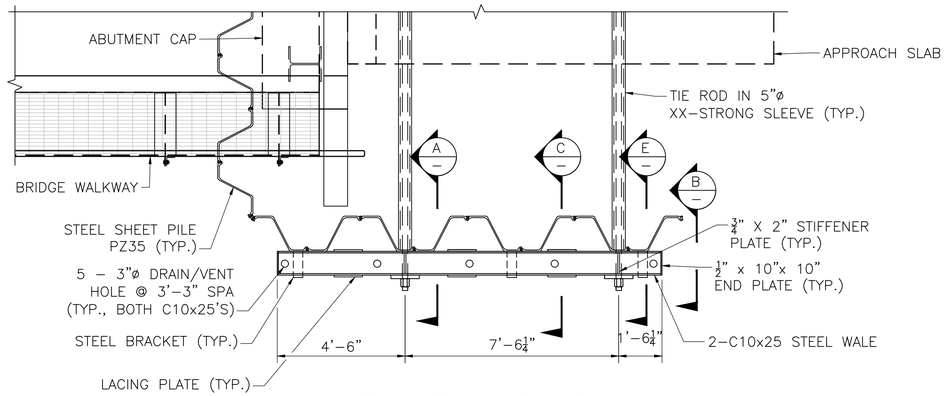
REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
PRECAST APPROACH SLAB DETAILS

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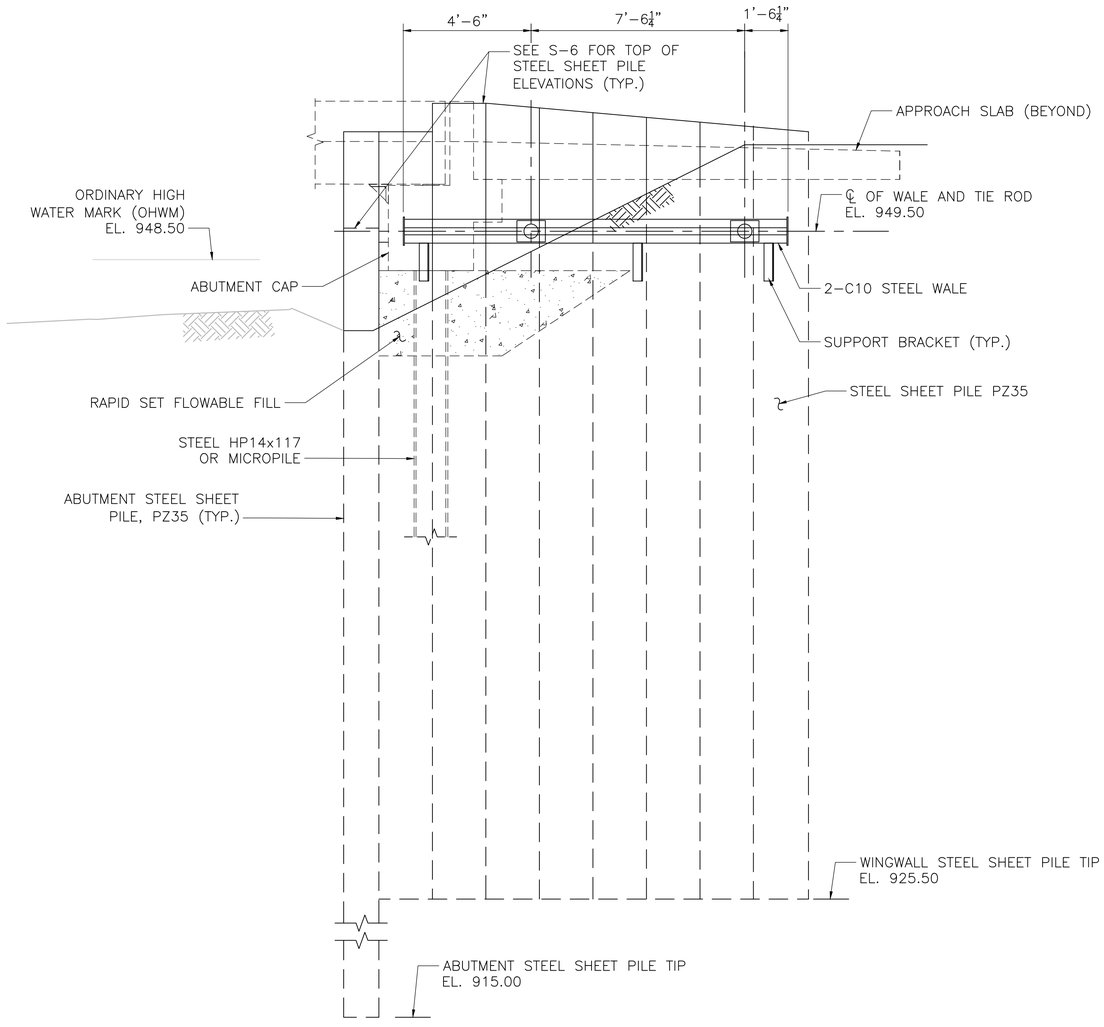
massDOT Massachusetts Department of Transportation Rail & Transit Division

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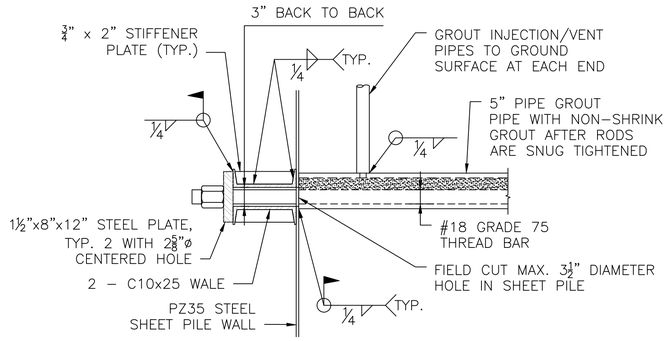
STEEL SHEET PILE PLAN

SCALE: 3/8" = 1'-0"



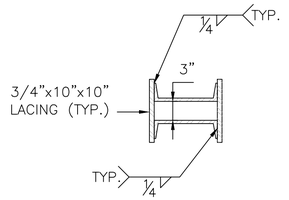
STEEL SHEET PILE WINGWALL ELEVATION

SCALE: 3/8" = 1'-0"



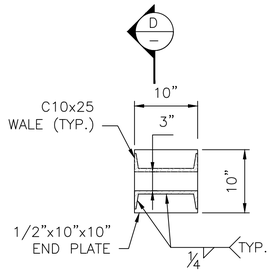
SECTION A

SCALE: 1" = 1'-0"



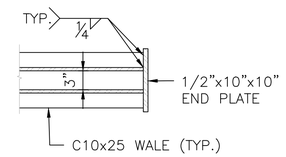
SECTION C

SCALE: 1" = 1'-0"



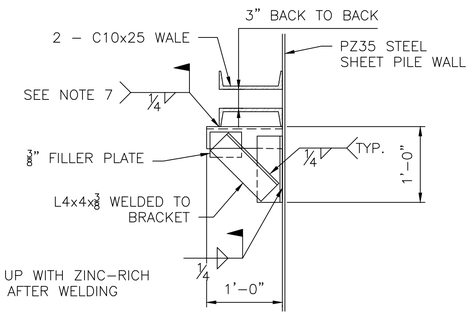
SECTION B

SCALE: 1" = 1'-0"



SECTION D

SCALE: 1" = 1'-0"



SECTION E

SCALE: 1" = 1'-0"

NOTES:

1. STRUCTURAL STEEL AND PLATES SHALL CONFORM TO ASTM A709, GRADE 50 AND SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
2. STEEL TIE ROD SHALL BE DYWIDAG THREADED BAR GRADE 75 AND SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.
3. BOLTS, NUTS AND WASHERS SHALL CONFORM TO ASTM A307 GRADE B AND SHALL BE HOT-DIP GALVANIZED IN ACCORDNACE WITH ASTM A153.
4. PROVIDE FULL-WIDTH STEEL SHIMS BETWEEN SHEET PILE AND WALES. TACK WELD STEEL SHIMS TO SHEET PILES.
5. STEEL PIPE SHALL BE ASTM A53, TYPE S, GRADE B, XX-STRONG, PLAIN ENDS.
6. NON-SHRINK GROUT SHALL BE HIGH STRENGTH GROUT AND HAVE MINIMUM 4,000 PSI COMPRESSIVE STRENGTH WITHIN 24 HOURS.
7. TOUCH UP WITH ZINC-RICH PRIMER AFTER WELDING.
8. FOR ADDITIONAL NOTES, SEE DWG. S-1.

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

REPLACEMENT OF BRIDGES ON BERKSHIRE LINE
BRIDGE 79.81 - WILLOW CREEK BRIDGE
STEEL SHEET PILE WALL DETAILS

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

HDR, INC.
99 HIGH STREET, SUITE 2300
BOSTON, MA 02110
(617) 357-7700

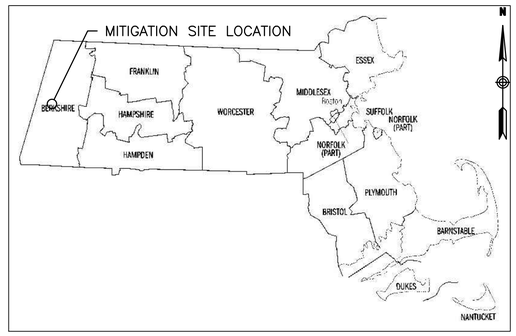
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MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
RAIL & TRANSIT DIVISION

WETLAND MITIGATION FOR REPLACEMENT OF BRIDGES 77.04 AND 79.81

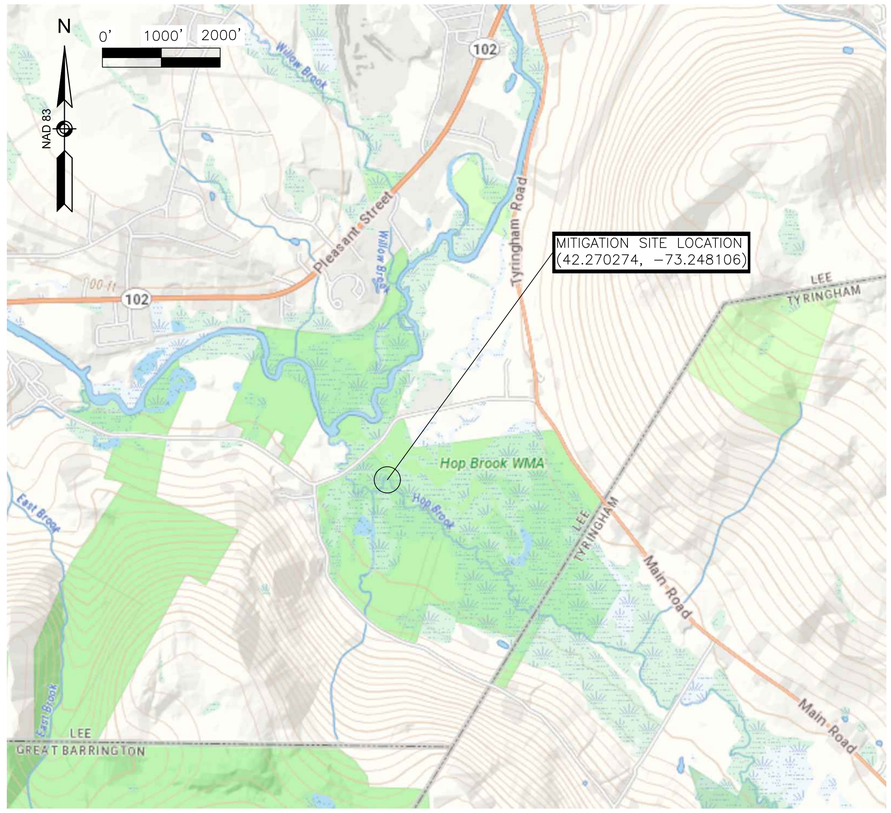
PROJECT LOCATION: LEE, MA



LOCATION MAP

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
G-1	TITLE SHEET & INDEX
E-01	TEMPORARY ACCESS AND LAYDOWN PLAN
E-02	SITE PLAN AND SECTION
E-03	DETAILS 1 OF 2
E-04	DETAILS 2 OF 2



LOCUS MAP

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

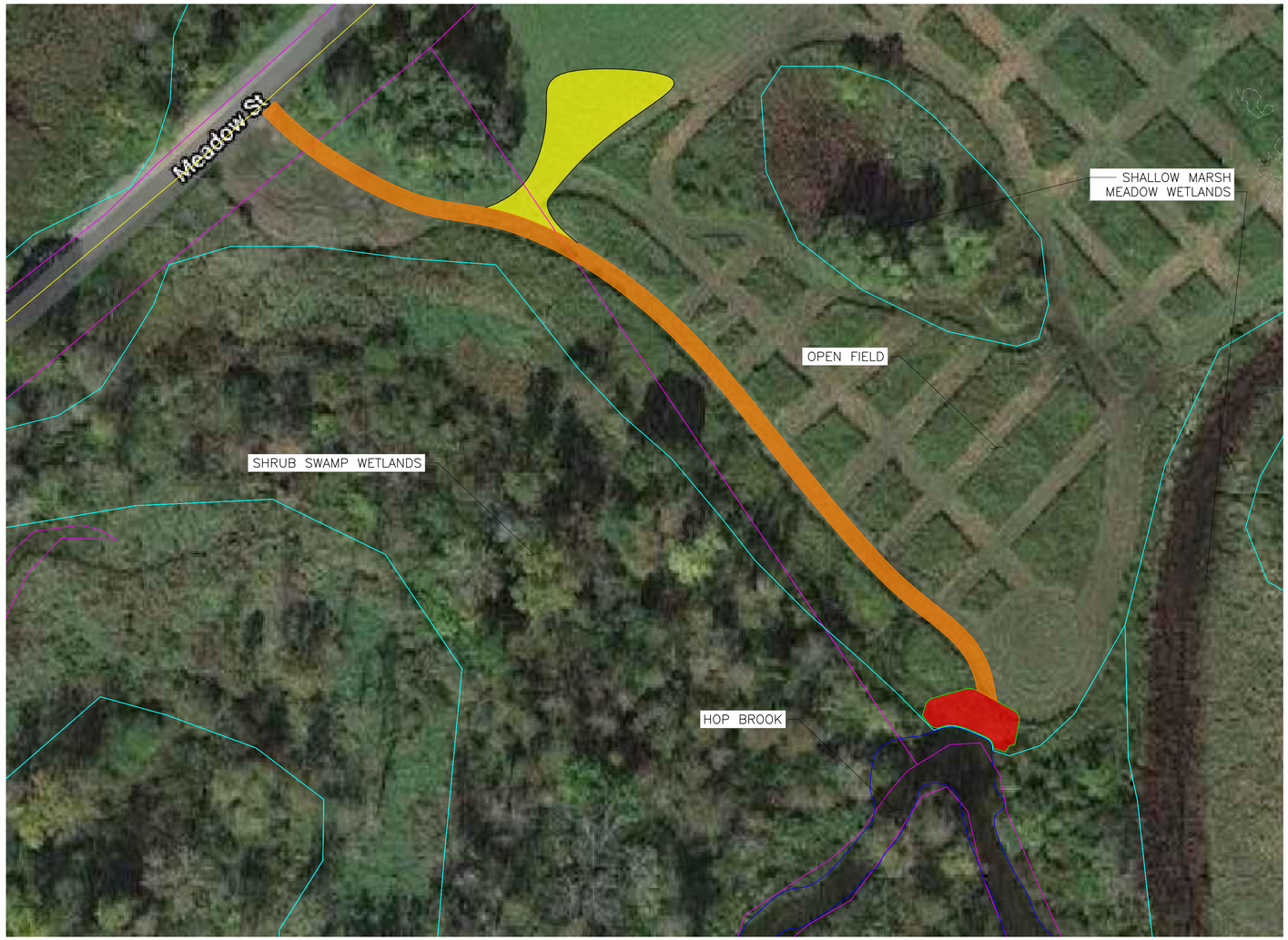
WETLAND MITIGATION FOR REPLACEMENT
OF BRIDGES 77.04 & 79.81
TITLE SHEET & INDEX

ISSUE	DATE	DESCRIPTION	BY	CHK'D	APP.

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TEMPORARY ACCESS AND LAYDOWN PLAN

SCALE: 1"=80' @ 11"x17"

LEGEND:

- WETLAND MITIGATION AREA
- TEMPORARY ACCESS ROUTE DURING CONSTRUCTION PERIOD
- TEMPORARY LAYDOWN AREA DURING CONSTRUCTION PERIOD
- LIMITS OF MITIGATION
- APPROXIMATE EDGE OF HOP BROOK
- MASS GIS OLIVER WETLAND BOUNDRY
- MASS GIS OLIVER TAX PARCELS
- MASS GIS OLIVER ROADWAYS

NOTE:

SEE SHEET E-002 FOR NOTES

MASSDOT BERKSHIRE LINE IMPROVEMENTS
CONTRACT NO. 120593

WETLAND MITIGATION FOR REPLACEMENT
OF BRIDGES 77.04 & 79.81
TEMPORARY ACCESS & LAYDOWN PLAN

HDR, INC.
99 HIGH STREET, SUITE 2300
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WETLAND REPLICATION AREA SEDIMENTATION AND EROSION CONTROL NOTES:

1. PRIOR TO STARTING ANY WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION & SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN ALL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. THE EXISTING SITE INFORMATION WAS OBTAINED FROM VARIOUS SOURCES. NO FIELD SURVEY WAS PERFORMED BY THE DESIGNER. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SITE INFORMATION PRIOR TO CONSTRUCTION.
3. SEDIMENT CONTROL MEASURES SHALL BE ADJUSTED TO MEET FIELD CONDITIONS AT THE TIME OF AND DURING ALL PHASES OF CONSTRUCTION AND BE CONSTRUCTED PRIOR TO AND IMMEDIATELY AFTER ANY GRADING OR DISTURBANCE OF EXISTING SURFACE MATERIAL ON THE SITE.
4. PERIODIC INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL STRUCTURES SHALL BE PROVIDED TO INSURE THAT THE INTENDED PURPOSE IS ACCOMPLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT LEAVING THE LIMIT OF WORK. SEDIMENT CONTROL MEASURES SHALL BE IN WORKING CONDITION AT THE END OF EACH WORKING DAY.
5. ALL POINTS OF CONSTRUCTION INGRESS OR EGRESS WILL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS.
6. AFTER ANY SIGNIFICANT RAINFALL, SEDIMENT CONTROL STRUCTURES SHALL BE INSPECTED FOR INTEGRITY. ANY DAMAGED DEVICES SHALL BE CORRECTED IMMEDIATELY.
7. ALL STOCKPILES SHALL BE PROTECTED AND LOCATED AWAY FROM EXISTING WATER BODIES & WITHIN THE LIMIT OF WORK.
8. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.
9. ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF-SITE.
10. AN EROSION CONTROL BARRIER SHALL BE INSTALLED ALONG THE EDGE OF THE PROPOSED WETLAND MITIGATION AREA.
11. THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL EROSION AND SEDIMENT CONTROLS AT THE COMPLETION OF SITE CONSTRUCTION.
12. MEANS OF EROSION AND SEDIMENT PROTECTION AS NOTED ON THE DRAWINGS INDICATE THE MINIMUM PROVISIONS NECESSARY. ADDITIONAL MEANS OF PROTECTION SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED FOR CONTINUED OR UNFORESEEN EROSION PROBLEMS, AT NO ADDITIONAL EXPENSE TO THE OWNER.
13. THE CONTRACTOR SHALL USE TEMPORARY SEEDING, MULCHING OR OTHER APPROVED STABILIZATION MEASURES TO PROTECT EXPOSED AREAS DURING PROLONGED CONSTRUCTION OR OTHER LAND DISTURBANCE. STOCKPILES THAT WILL BE EXPOSED FOR LONGER THAN 15 DAYS SHALL BE SEEDED WITH AN ANNUAL RYE.
14. ALL STOCKPILED MATERIALS SHALL BE LOCATED AT LEAST 100 FEET FROM THE WETLANDS AND 200 FEET FROM PERENNIAL WATERCOURSES. EXCESS EXCAVATED MATERIALS SHALL BE REMOVED FROM THE SITE IMMEDIATELY AND PROPERLY DISPOSED OF AFTER EXCAVATION.

WETLAND REPLICATION AREA PLANTING NOTES AND CONSTRUCTION SEQUENCE:

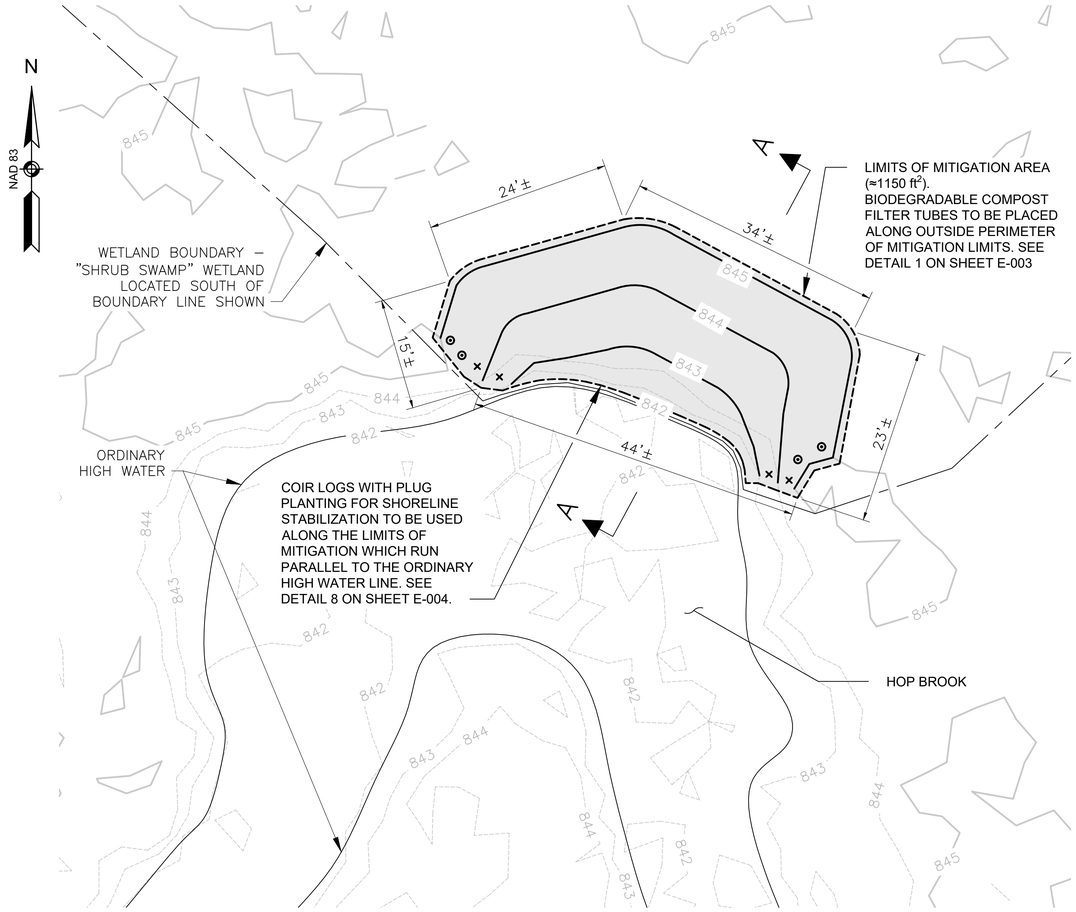
1. EROSION CONTROLS WILL BE INSTALLED ALONG THE EXISTING WETLAND BOUNDARY. THIS WILL ALLOW THE SITE CONTRACTOR TO PROPERLY TIE - IN PROPOSED CONTOURS AT THE EDGE OF THE EXISTING WETLAND
2. A WETLAND SPECIALIST SHALL BE PROVIDED BY MASSDOT AND BE ON-SITE TO MONITOR CONSTRUCTION OF THE WETLAND MITIGATION AREA TO ENSURE COMPLIANCE WITH THE MITIGATION PLAN.
3. UNDER THE DIRECTION OF THE WETLAND SPECIALIST, THE CONTRACTOR SHALL PROVIDE ROUGH GRADING (+/- 3 INCHES) WITHIN THE REPLICATION WETLAND. WETLAND MITIGATION GRADING IS SUBJECT TO MODIFICATION BASED ON ACTUAL SITE CONDITIONS. THE WETLAND SPECIALIST WILL INSPECT THE SUB-GRADE OF THE REPLICATION AREA TO ENSURE THAT STE PROPER HYDROLOGY AND MICROTOPOGRAPHY HAS BEEN ESTABLISHED.
5. PRIOR TO SOIL ADDITIONS AND/OR PLANTINGS, PROJECT SURVEYORS SHOULD VERIFY THAT GRADES HAVE BEEN ACHIEVED AS SHOWN ON THIS DRAWING OR AS DIRECTED BY THE WETLAND SPECIALIST.
6. PRIOR TO PLANTING, THE MITIGATION AREA SHOULD BE EXCAVATED APPROXIMATELY 1 FOOT BELOW THE FINISHED GRADE OF THE WETLAND MITIGATION AREA. FOLLOWING EXCAVATION OF THE MITIGATION AREA, A WETLAND TOPSOIL MIXTURE (NATURAL OR MANMADE) SHALL BE USED TO BRING THE EXCAVATED WETLAND MITIGATION AREA TO FINISHED GRADE. PRIOR TO USE, THE SOIL MIXTURE WILL BE ANALYZED BY A SOIL TESTING LABORATORY FOR TEXTURE AND NUTRIENTS. THE SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR THIS COORDINATION.
7. NO WOOD CHIPS WILL BE ADDED TO THE SOIL AMENDMENTS. A WETLAND SPECIALIST WILL REVIEW IMPORTED SOILS TO ENSURE THEY ARE FREE OF WASTE MATERIAL.
8. CARE WILL BE TAKEN DURING PLACEMENT OF SOILS IN THE REPLICATION AREA SO AS TO AVOID COMPACTION. SHOULD SOILS BE COMPACTED, THEY WILL BE LOOSENED MECHANICALLY OR BY HAND.
9. PENDING SITE AND WEATHER CONDITIONS ALL PLANTINGS WILL TAKE PLACE IN SPRING (MAY 15-JUNE 15) OR FALL (SEPTEMBER 1 - NOVEMBER 1).
10. ALL PLANTED SHRUB SPECIMENS SHALL BE EITHER BARE ROOT OR POTTED AND BE INSPECTED BY THE WETLAND SPECIALIST PRIOR TO PLACING THE SPECIMENS IN THE WETLAND MITIGATION AREA. PENDING SITE AND SEASONAL CONDITIONS, PLANTINGS WILL BE WATERED THROUGHOUT THE FIRST GROWING SEASON AS NEEDED. ALL PLANT MATERIAL PLANTED IN THE WETLAND REPLICATION AREA SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING THE DATE OF FINAL ACCEPTANCE.
11. THE SHRUBS PLANTED IN THE MITIGATION AREA SHOULD BE PLACED AS NOTED ON THE PLANTING PLAN. SHRUB SHALL BE LOCATED IN THE FIELD BY THE SPECIALIST. SHRUB SPECIES SHALL BE CONSERVATION-GRADE, AND NEW ENGLAND NATIVE. SHRUB PLANTINGS SHALL NOT CONSIST OF SPECIES VARIETIES AND/OR CULTIVARS.
12. ALL PLANTS SHALL BE SET PLUMB AND STRAIGHT AND LOCATED IN THE CENTER OF THE PIT.
13. PENDING AVAILABILITY OF LISTED SPECIES, APPLICABLE SUBSTITUTES MAY BE USED UNDER THE DIRECTION OF THE WETLAND SPECIALIST.
14. A WETLAND SEED MIXTURE WILL BE SPREAD THROUGHOUT THE REPLICATION SITE AS SPECIFIED. SEED MIXTURE AND SOURCE SHALL BE APPROVED BY THE WETLAND SPECIALIST.
15. 4" OF LOAM (WEED-FREE, FINE SANDY LOAM), IF NECESSARY, AND A CONSERVATION/WILDLIFE SEED MIX WILL BE SPREAD IN ALL OTHER AREAS DISTURBED BY THE CONTRACTOR AS SPECIFIED (I.E. SITE ACCESS). LOAM, SEED MIXTURE AND SOURCE SHALL BE APPROVED BY THE WETLAND SPECIALIST.
16. TEMPORARY STRUCTURES AND DEVICES TO CONTROL EROSION AND SEDIMENTATION IN AND AROUND THE MITIGATION SITE SHALL BE DISASSEMBLED AND PROPERLY DISPOSED OF NO LATER THAN NOVEMBER 1 THREE FULL GROWING SEASONS AFTER PLANTING. SEDIMENT COLLECTED BY THESE DEVICES SHALL BE REMOVED AND PROPERLY DISPOSED OF IN A MANNER THAT PREVENTS ITS EROSION AND TRANSPORT TO A WATERWAY OR WETLAND.

WETLAND REPLICATION AREA GENERAL CONSTRUCTION NOTES:

1. CONTRACTOR TO VERIFY ALL EXISTING CONDITIONS OF SITE THROUGH SURVEY PRIOR TO THE START OF WORK, AND SUBMIT ALL FINDINGS AND ANY DISCREPANCIES TO THE ENGINEER FOR REVIEW.
2. CONTRACTOR SHALL LIMIT IMPACT TO, AND ENSURE COMPLETE PROTECTION OF, EXISTING CONDITIONS OUTSIDE SPECIFIED MITIGATION AREA. ALL TEMPORARY IMPACTS REQUIRE PRIOR APPROVAL BY THE ENGINEER. ANY AREAS APPROVED FOR TEMPORARY IMPACT SHALL BE RETURNED TO EXISTING CONDITIONS PRIOR TO CONCLUSION OF CONSTRUCTION.

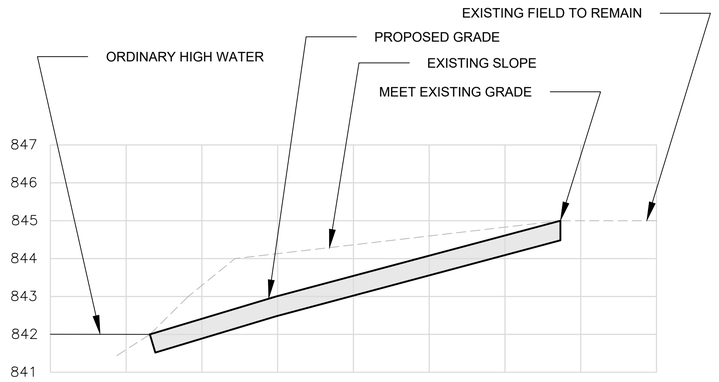
LEGEND:

- WETLAND SOIL AND WETLAND SEED MIX
- PROPOSED CONTOUR
- EXISTING CONTOUR
- LIMITS OF MITIGATION
- APPROXIMATE EDGE OF HOP BROOK
- WETLAND BOUNDARY
- ELDERBERRY PLANTING LOCATION
- BUTTONBUSH PLANTING LOCATION



WETLAND MITIGATION PLAN

SCALE: 1" = 20'–0" @ 11"x17"



WETLAND MITIGATION – SECTION AA

SCALE: (HOR. SCALE 1"=8', VERT. SCALE 1"=4') @ 11"x17"

MASSDOT BERKSHIRE LINE IMPROVEMENTS
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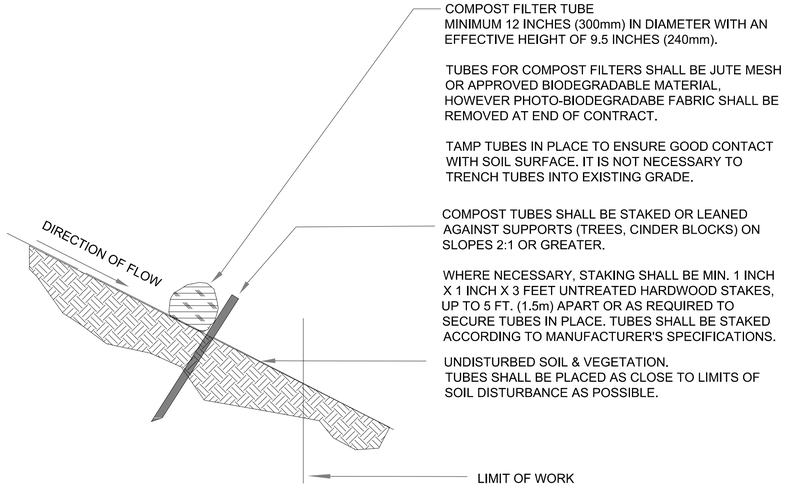
WETLAND MITIGATION FOR REPLACEMENT OF BRIDGES 77.04 & 79.81
SITE PLAN AND SECTION

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DETAIL 1 – COMPOST FILTER TUBE

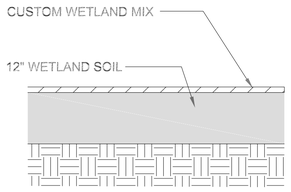
NOT TO SCALE

Plant Name	Plant Size	Plant Quantity[1]	Wetland Indicator Status	Planting Notes[2]
Spike rush (*Eleocharis palustris*)	2" plug	1 tray (50 plugs)	OBL	To be planted in coir log or just upgradient.
Soft rush (*Juncus effusus*)	2" plug	1 tray	OBL	To be planted upgradient of coir log. A good pioneer species that provides cover for wildlife. The root systems offer erosion protection. (OBL)
Green bulrush (*Scirpus atrovirens)*	2" plug	2 trays	OBL	To be planted in coir log or just upgradient. A good soil stabilizer, provides many of the same benefits as woolgrass and is resistant to both flooding and short periods of drought
Three square bulrush (*Schoenoplectus pungens*)	2" plug	2 trays	FACW	To be planted in coir log or just upgradient. Commonly found in standing water up to 6 inches deep. Can tolerate periods of drought and complete inundation.
Fowl bluegrass (*Poa palustris*)	2" plug	1 tray	FACW	To be planted above coir log intermixed with fox sedge. A native grass of marsh edges and wet meadows, reaching a height of 3-4'. Often forms dense stands that exclude other wetland species. Wildlife and ground nesting birds frequently use this grass for cover and nesting
Fox sedge (*Carex vulpinoidea)*	2" plug	1 tray	OBL	To be planted above coir log intermixed with fowl bluegrass. A sedge common to wet meadows, this plant provides good cover for nesting birds
Elderberry (*Sambucus canadensis)*	3 – 4 ft	4	FACW	Plant as marked on plans. Found growing in wet meadows and marshes. White umbel flowers in summer form black fruit in fall. Valued as food for many bird species.
Buttonbush (*Cephalanthus occidentalis*),	3 – 4 ft	4	OBL	Plant as marked on plans. To be planted along wetland boundary. Medium-sized shrub, white globular-shaped flowers in summer. Prefers soils flooded or saturated for long periods or fluctuating hydrology.

[1] Assumes an average plant spacing of roughly 1-1.5 feet on center for plugs and 5 feet on center for shrubs.

[2] Source: New England Wetland Plants, Inc.

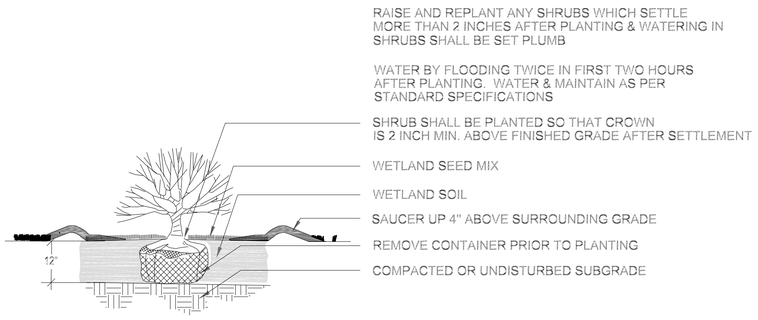
PLANTLIST WETLAND – DETAIL 4



NOTES:
1. WETLAND SPECIALIST SHALL APPROVE GRADES PRIOR TO SOIL INSTALLATION.
2. SEE NON TIDAL WETLAND MITIGATION SPEC FOR SOIL AND PLANTING REQUIREMENTS.

DETAIL 2 – WETLAND REPLICATION

NOT TO SCALE



DETAIL 3 – WETLAND SHRUB PLANTING

NOT TO SCALE

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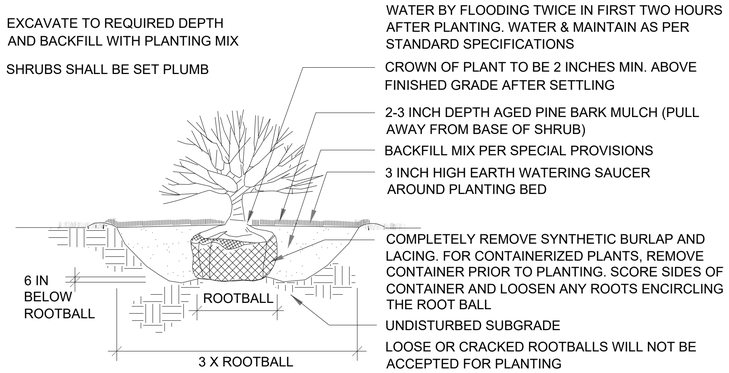
WETLAND MITIGATION FOR REPLACEMENT OF BRIDGES 77.04 & 79.81
DETAILS 1 OF 2

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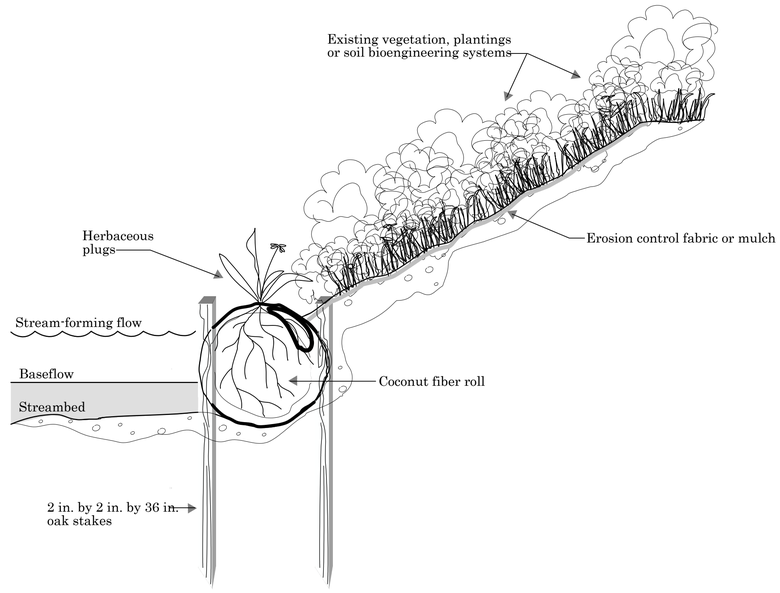
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SHRUB PLANTING – DETAIL 5

NOT TO SCALE



COCONUT FIBER ROLL – DETAIL 6

NOT TO SCALE

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CONTRACT NO. 120593

WETLAND MITIGATION FOR REPLACEMENT
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DETAILS 2 OF 2

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